VOLUME VII MARCH, 1914 NO. 3

Southern Medical Journal

Journal of The Southern Medical Association

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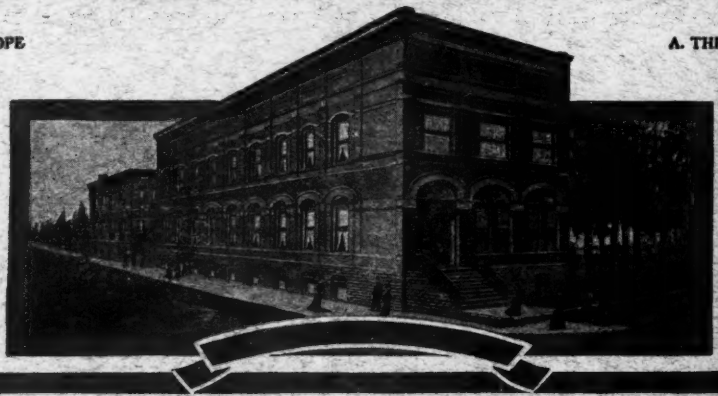

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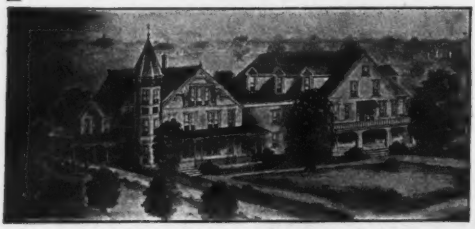

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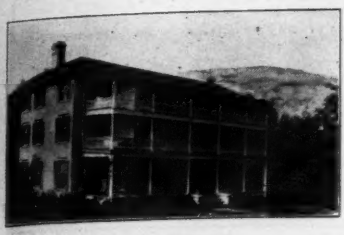

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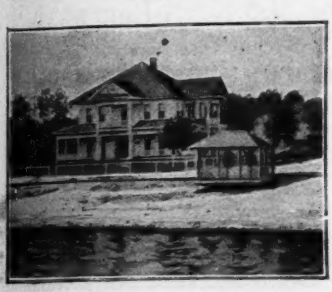

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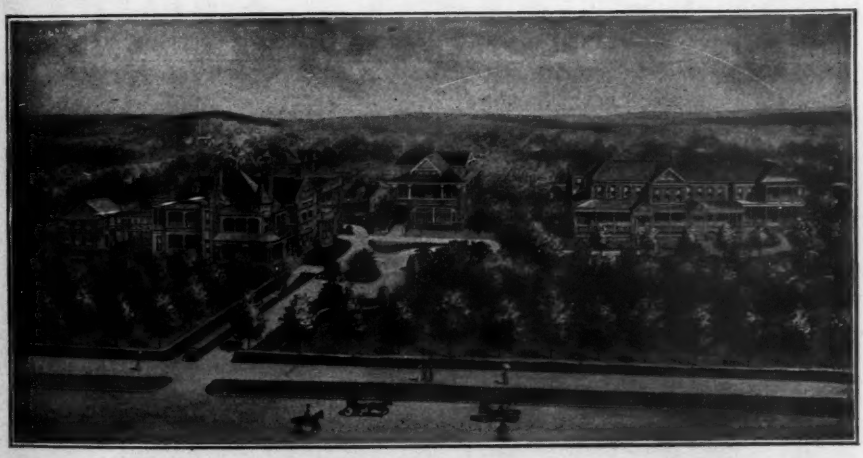

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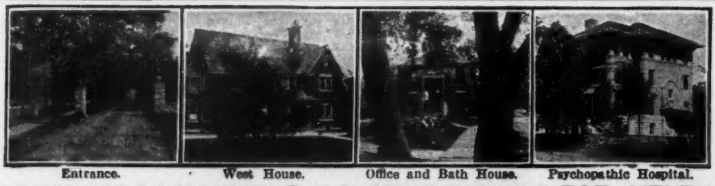

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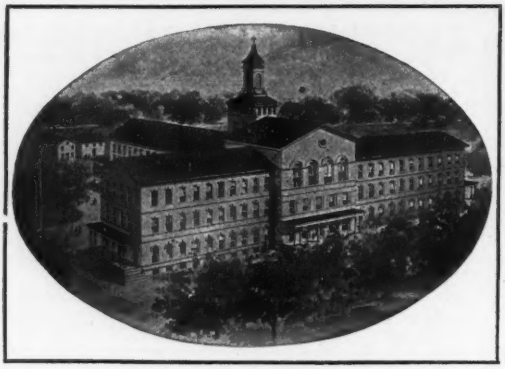

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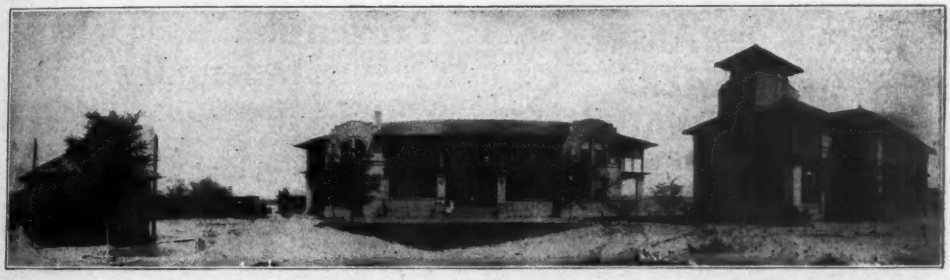

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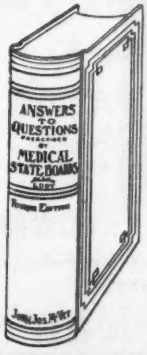

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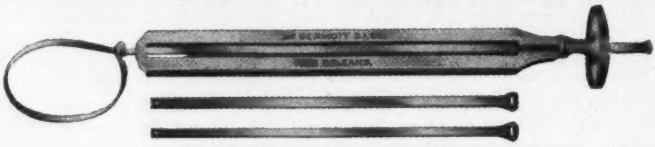

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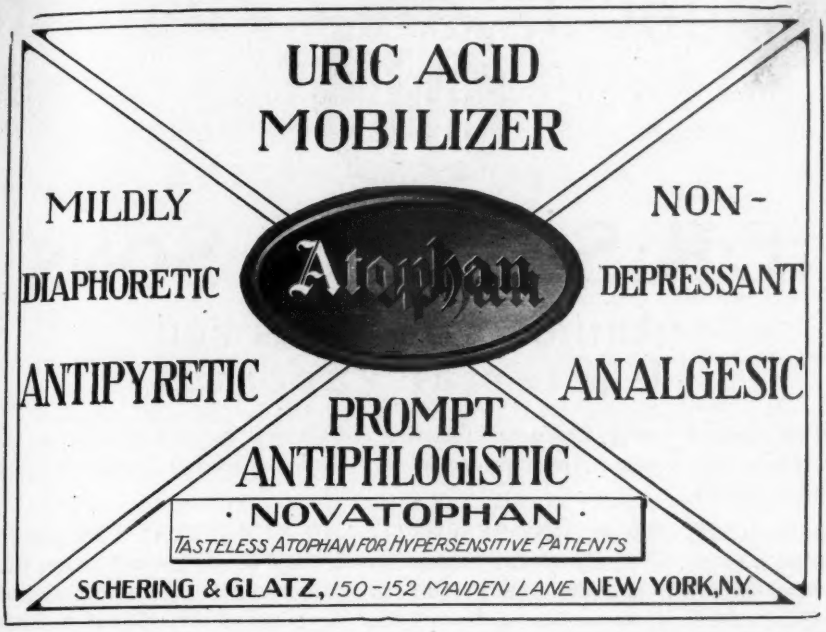

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ORIGINAL ARTICLES

MILK IN ITS RELATION TO INFANT MORTALITY.*

By Henry Enos Tuley, M.D.,
Louisville, Ky.,

Secretary Mississippi Valley Medical Association, Ex-President American Association Medical Milk Commissions, Visiting Physician Masonic Widows and Orphans' Home, Etc.

No topic is so absorbing, no subject of greater importance than the prevention of infant mortality. Slaughter of the innocents is no Biblical story; it is a condition which has confronted our people for generations, and we are just awakening to the appalling infant mortality which for years has gone practically unnoticed.

There are many causes which enter into the heavy mortality among infants under five years of age, but we are limited by the title of these remarks to milk in its relation to infant mortality.

In passing, we might mention the unpreparedness of the average graduate in medicine to enter the practice of midwifery, which unquestionably is responsible for the early death and invalidism of many infants which come under his care. Improper feeding directions during the first weeks of life is a potent factor in morbidity, if not mortality.

It may be considered as axiomatic that breast milk is the ideal food for the infant, yet how often we see breast-fed infants who are not thriving, due in most cases to irregularity in nursing or indiscriminate mixed feeding at too early an age. Regularity in nursing is the *sine qua non* of success. The two-hour schedule by day and four hours at night has many advocates. Many, however, recommend more infrequent nursing, even to the four-hour intervals from the beginning. There are but few contra-indications or physical defects and disabilities which will prevent maternal nursing. The number of mothers who deliberately refuse to nurse their babies for fancied social obligations is small in comparison to what is believed by some authorities. Yet there is something radically the matter with the latter-day mother, for the percentage of babies artificially fed after the third month, because of failure in the breast supply, is constantly increasing, hence it behooves the physician, being one of the guardians of the infant, to seriously consider the most universally used artificial food, in all its phases, especially looking to the elimination of it as a cause of this mortality.

Because of the readiness with which cow's milk is produced, and the quantity available at a moderately reasonable price, it is the most universally used artificial infant's food today. No more study has been given any subject than has been put upon milk, yet there is much about it for us to learn.

The one fact which stands out most prominently in regard to milk is that it must be clean and cold from the moment of its production until ready to be used. With a view of making this possible, Dr. Henry L. Coit many years ago conceived the idea of Certified Milk and the milk commission to guarantee that the necessary precautions were taken in the production and handling of the milk to keep it

*Read in Section on Medicine of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

clean and cold, and safe to be used for infant feeding. Most of you are familiar, I feel sure, with the growth and development of the milk commission idea in this country since the organization of the first commission. The growth of the idea into so many practical working commissions has been beyond the fondest hope of its founder, and unquestionably it has been one of the most potent factors in the reduction of infant mortality in recent years. Clean milk being a possibility, it has naturally resulted in the formation, in many communities, of infant welfare associations, whose prime object is the carrying of the gospel of clean milk and infant hygiene into the homes of the ignorant poor, to assist in the education of the mothers and the "little mothers"—the older children—in the care of the milk in the home, its proper modification, and the simple rules of hygienic management of the child. As I have just said, clean milk has made this possible, but I would not minimize in the least the wonderful work which is being done by these infant welfare associations. The health officer in my home city, in his last annual report to the Council, makes the broad statement that through the agency of the Babies' Milk Fund Association and clean milk the mortality among infants under five years of age from preventable diarrheal diseases has been reduced 50 per cent.

Just here may I say that the medical profession in most communities is decidedly remiss in not taking a more active part in all social service and uplift movements, especially those which have to do with child welfare work. Too often these altruistic efforts are left entirely in the hands of the laity and are ill directed and poorly managed. The medical profession is at fault for this and should take a more active personal part in all social uplift work, and this is more especially true of the work which must be done in the introduction and distribution of clean milk in the homes of the poor. The work of the nurse in the homes of the babies is productive of the greatest good. Community service and organized effort is the only way this problem can be solved. Where babies in a neighborhood remain well they are visited weekly, and in the case of illness, daily or oftener. The nurse works with the definite purpose of keeping all the babies in her district well. She teaches the mothers how to care for the milk in the home, the scientific care of the child, the feeding, bathing, clothing, and daily routine of its life. She teaches the mother how to recognize when the child is sick and the necessity of reporting such conditions at once rather than allow "nature to take its course." If no such organization exists in your city interest the club women and philanthropists, and start one at once; keep in touch with their work, and direct their activities and so become instrumental in stemming the tide of the wanton destruction of the innocents through ignorance of right living.

We who have watched the work of the medical milk commission in our city have been able to see the good effect it has had, by example, upon the general market milk supply, which is infinitely better now than formerly. Diarrheal diseases are very prevalent in communities where milk from swill-fed cattle is generally used, and under no circumstances should swill ever be fed to dairy cattle. Legislative enactment may be necessary before the practice is stopped, but no effort short of an appeal to the law-making bodies of the city and state should be decided upon. Formerly Louisville had many such dairies, and it now has none. Cincinnati has had the same experience, the State Legislature being finally appealed to before relief was obtained, and the feeding of swill discontinued.

Recent investigations have pointed out a new menace to users of milk, viz., the infection of cow's milk with the *B. abortus,* a bacillus first described by Bang in 1896. According to Cotton and Schroeder, 10 per cent of market milk contains the *Bacillus abortus.* Finding the blood of 17 per cent of 425 children examined by the complement fixation test to contain antibodies against the *B. abortus,* Lawson and

Sedgwick believe a decided menace to infant users exists in milk so infected. Because of this prevalent trouble, Schroeder advocates that Certified as well as market milk should be efficiently Pasteurized, or preferably boiled under official supervision. Before this radical rule is promulgated and enforced a very careful investigation of Certified milk should be made and the percentage, if any, definitely determined by the commission's bacteriologist. Under the careful veterinary supervision of Certified herds we doubt if much of this trouble exists.

The possibility of milk bearing the contagium of epidemic diseases should be borne in mind, typhoid fever, scarlatina and diphtheria being those most easily borne. So far as I have been able to learn, no case of measles has been traceable to milk as the infectious agent.

The frequency of infection of market milk by the *bacillus abortus,* and its possible menace to the infant; the danger of contagions by an infected milk supply; the enormous bacterial content of the average market milk, all bring to mind the possible rendering safe the market milk supply by Pasteurization or sterilization. The regulation of these procedures is a serious problem in the municipal control of a city's milk supply. Unfortunately the average consumer who thinks of it at all is lulled into a false sense of security when he learns the milk has been Pasteurized and does not take even the ordinary precautions to keep the milk cold and free from contamination after its delivery in the home. The flash process of Pasteurization is not effectual in destroying any of the pathogenic bacteria or their spores, but does destroy the lactic acid bacilli, allowing the milk to decompose before it sours. Such milk is absolutely unsafe for infant feeding. Pasteurization and sterilization should be under municipal control and inspection, and education of the consumer persistently carried on to be sure he properly cares for the milk in the home.

As to the relative nutritive qualities of cooked and uncooked milk, I am unable to speak authoritatively. The old idea that some of the life-giving qualities of raw milk are destroyed by heat is difficult to eradicate, though the highest authorities and most careful investigators disclaim that there is any deleterious effect from heat. That it is necessary to heat Certified milk to render it safe, I am unable as yet to agree.

In conclusion, may I leave this thought with you: Only by organization of those interested in child welfare work, in each community, and the carrying of the gospel of clean milk and child hygiene into the homes of the poor can we hope to stem the tide of infant mortality and save these babies to society.

DISCUSSION.

Dr. McGuire Newton, Richmond, Virginia.—To those who have to do with children, one of the most important subjects is feeding, and unfortunately they are confronted by the question of artificial feeding. With reference to Certified milk, except in but very few cities in the South it is impossible for us to have Certified milk. No one of you would undertake to inject bacterial products into a child without selecting some particular manufactured product. The same thing should hold in reference to good milk. We should not prescribe blindly milk without knowing the source from which the milk comes. If we are interested in the milk that is being used, the laity will be interested, and we can educate them to it. In the city of Richmond we are unable to have Certified milk. In place of this, Richmond has the cleanest municipal milk supply in this country through the active, persistent inspection and investigation of a high-priced, efficient man. It is important to have a knowledge of the dairy conditions. This was impressed upon me several years ago. My work is limited entirely to children. I observed on Christmas day and the day following that there was an unusual amount of milk infection. My practice in the week following Christmas was like my practice in the last week of May and the first week in June—I had to deal with the same character of cases. We expect in older children digestive disturbances. I made investigations along this line, saw the dairy man, and got from him a confession that the dairy supplying the milk to Richmond began to save the milk. The result was that from the 15th of December until that Christmas day no fresh milk was delivered in Richmond. Any milk left over from today was included in tomorrow's supply. They had to have a supply Christmas. Following that I wrote a letter to my patients and directed them to boil the milk from the middle of December until Christmas day. As a result there was not one single case of milk infection in my practice.

Dr. Fred J. Mayer, Opelousas, Louisiana.—If

the child is the state's most valuable asset, and who can doubt it? If the value of a human life reaches as high as stated by one of the speakers, who preceded me, and we have the highest statistical testimony of Prof. Irving Fisher, of Yale, who has set the value of $8,000 upon it, then there is no more important sanitary problem confronting civilized races than the sanitary control of milk, the great liquid food. Here again the logic of the situation points to public education in the dangers of depraved milk and the necessity of a pure, wholesome, cooled supply from cow to consumer.

It is truly anomalous that business men are always ready to invest thousands in schemes to advertise a community and to bring to it foreign immigrants, foreign not only to our language, but too often to our ideals, in that sense unassimilable; and while this country has been built up by immigration and continues to receive vitality therefrom, mixed with the tide that beats upon our shores come derelicts that sooner or later will vex the body politic, while no effort is made by the business world to conserve the precious lives we already have here, bone of our bone, and blood of our blood.

In Southwestern Louisiana a magnificent boosters' organization was recently set in motion to advertise the unrivaled agricultural and health resources of the Attakapas country, and the salary of the manager was fixed somewhere near $3,600 a year; at the same time the health officer of the most important county unit in the organization made an ineffectual attempt to get a salary raise of a few hundred dollars. So, clearly, the business world needs arousing as to the economic aspect, and the loss that comes from preventable diseases, and not the least from depraved milk and the necessity for its sanitary control. From the humanitarian side, of course, it is not an open question. The purveyor of depraved milk occupies a niche in the rogues' gallery, sui generis. Alongside of him the sneak thief and the highway robber are comparatively respectable.

The former may have filched a flitch of bacon to save a starving family; the other has perhaps lived so long under high protection that he fails to understand the difference between meum and tuum, but the purveyor of depraved milk, for sordid lucre, strikes down the helpless infant in the cradle and is responsible for 50 per cent of the mortality in the first year of infant life that is bottle fed.

In view of the sinister fact, that the infant mortality of Washington, D. C., equals that of Russia, and the fact of possible milk infection by water borne parasites, by fecal matter of man and domestic animals, by tuberculosis, typhoid, diphtheria, scarlet fever, and sore throat, not to speak of diseases of the cow that affect the milk injuriously, like actinomycosis, foot and mouth disease, garget, milk sickness, or any febrile or septic condition; and the further fact that the average milk, when it reaches the consumer, contains more bacteria than sewage, should emphasize the necessity of insisting on a bacterial standard for all milk sold to the public as of infinitely more importance than a chemical standard; in no instance in the large cities should more than 100,000 per c.c. be permitted, and in the smaller towns 50,000 per cc. should be the limit, as in the latter it is easier to get the milk from cow to consumer than in the cities, for every time that milk is handled, even from vessel to vessel, there is an increase in the bacterial count.

Any dairyman of ordinary intelligence can learn the technic of a quantitative if not qualitative bacterial count, and with a ten-dollar microscope and by greater cleanliness and freer use of cold water or ice in cooling, at no extra expense, keep within the danger limit; for beyond 100,000 per cc. lies the pathogenic zone.

Certified milk for infant feeding should, of course, not contain over 100,000 per cc.

The public should be educated to the danger, and to the necessity and justice of dividing the increased expense with the dairyman entailed in the proper sanitary control of the milk supply, and the establishment of a bacterial standard. As it is, they will buy depraved milk by preference if cheaper. Here the police power of the state should step in and protect ignorance against itself in the slaughter of the innocents.

Dr. L. W. Elias, Asheville, North Carolina.—The establishment of a Certified milk dairy in Asheville has convinced us that the country is demanding Certified milk. A large number of tourists come there each year fully alive to the importance of Certified milk; many write ahead to make sure that they can get it. At present there is nothing more important in securing pure milk than raising it to the point where it can be Certified. But, while this meets the needs of the upper and middle classes, it does not reach the poorer population and those living in the country, so that in solving the problem of the best milk for them other measures must be resorted to. There are several points to emphasize in securing tolerable milk for the poor: 1. As clean milk as possible; 2. Its nearness to the market—the shortest possible time between the milking and the delivery to the customer. In Asheville Certified milk can be kept 18 hours, the germ count remaining below 2,000. Milk from much less sanitary dairies can be delivered within a few hours with a germ count running not much above 20,000 or 30,000, so that the time element in delivering milk is quite important, and although this milk is much more contaminated than the other, yet if kept clean and cool after delivery it is fair milk. The care of the milk after delivery is almost as important as the delivery of pure milk. In this connection it may be mentioned that ice is cheaper than good milk. It is not preferable to good milk, but in many cases it is preferable in the choice between two evils.

3. The character of the cow should be looked into, whether she is a Jersey, giving very rich milk, or a cow giving much less rich milk. Babies fed on milk containing over 4 per cent fat are pretty apt to have digestive disturbances. So it is well to look into the question of the richness of the milk as well as the purity of it.

I do not agree with the doctor in his sweeping condemnation of the purveyor of milk not up to the highest standard. The dairyman is not a wealthy philanthropist, but a small dealer financially unable to produce milk much purer than the public is able or willing to pay for. Of course, we want the best milk that we can get; but the

public must be educated to do their part and not expect all of the dairyman. From my experience on the farm, I think that any dairyman's milk is better than the average cow's milk where that animal is milked by the usual town or country servant.

Dr. Louis Leroy, Memphis.—An unfortunate point is in the handling of milk. Diseases, poverty and filth have not always gone hand in hand, and a large proportion of our summer diseases among infants comes from the fact that the milk is not as well kept in the home as it is in the country, as it is handled in the dairy or is brought from the dairy to the home. That is another point where an educational campaign becomes necessary. The dairyman cannot be blamed for more than half of the trouble. The home, and handling of the milk in the house, are certainly entitled to half the blame, if not more.

The point was touched on by a previous speaker that where we have substitution the best thing is to keep one cow in a stable in some way, and feed the child or children with nothing but the milk from one cow. That plan may have some things to recommend it, but it likewise has some drawbacks. Milk from any one cow will vary materially from day to day. The proteid and carbohydrate per cent in milk from a herd maintain an average. One ingredient will be low today and the next one a little higher. Milk from a herd will run to the average composition. Milk from one cow will vary in composition. Herd milk is more regular than that from an individual cow.

At the present time, considering the price of foodstuffs, it is practically impossible to surround the milk with all the safeguards which we would like to have introduced. With a concrete stable, running water, careful attendants, and proper icing of the milk, the milk will come quite close to costing as much as it brings. There is not sufficient difference in price between the cost of production and the cost of sale to permit as many safeguards as are desirable to be thrown around the milk and leave a reasonable profit. If that is the case, the next choice of two evils is pasteurization, and without any question proper pasteurization of milk is the only solution for general city use unless the city is able and willing to submit to a very large increase in the price of the product, which, again, they are not, excepting in some instances. If we take up milk as a food for the poorer classes pasteurization under proper inspection will give us the best general results; but much may be done by proper care of milk, by cutting up the milk routes, so that delivery will occur promptly, and by cutting out the big open can at the corner grocery store that is filled up in the morning and dipped into and out of with a dirty dipper. In handling the milk it should be put into suitable bottles and delivered to the market as soon as possible. In Memphis we have gone one step further in baby milk, in that night milk is separated entirely and used only for butter or cheese making, or something of that kind. Separating the night and morning milk for baby feeding gives us a considerable advantage in freshness, as it is usually delivered in the home within 4 hours after milking.

Dr. J. R. Morrison, Louisville.—I think we all agree that Certified milk is the ideal to be sought. I am a member of the milk commisison in Louisville, and I find Certified milk has put general market milk on a higher plane than it has ever been before. Although I am a member of a milk commission, I doubt the advisability of Certified milk in many communities on account of its expense, and I would thoroughly agree with what Dr. Leroy has said, that the practical solution must be through proper pasteurization, not by the flash process, but by the holding process. Pasteurized milk should be handled as carefully as certified milk. Pasteurization does not keep it from becoming unclean if improperly handled.

Dr. Tuley spoke of the care of milk in the home. This is an important point. In the Babies' Milk Fund Association we have specially prepared a little icebox, into which we put one or two cents' worth of ice a day. This keeps the milk perfectly cool. A milk of low bacterial count may be furnished a family, and if they keep it in a dirty, hot place in a short while it is unfit for use.

Another thing that he mentioned was the advantage of instructing the public through trained nurses, through child welfare and infant feeding stations. There are great advantages to be gained from this kind of work.

Dr. William E. Ross, Jacksonville, Florida.—I have been connected with the milk commission of Jacksonville for five years. At that time the Jacksonville milk supply had a high bacterial count. The milk commission started five years ago and did a great deal of work. Soon after that our function was taken away from the City Board of Health, and Dr. Terry has gotten a milk supply in as fine a condition as in any city in the country.

Dr. Leroy spoke about the increase in the price of Certified milk. Jacksonville has never had any Certified milk, but we have a milk supply, as tested by the City Board of Health, that runs a bacterial count from 2,000 to 5,000. This milk is put on the market; at the same time the price is always put on. The general supply to the city is by ordinance compulsory, and that milk is brought into the city iced, or in proper condition. The bacterial count is low as compared with what it was.

One dairy, which is the cleanest of all, has had a bacterial count varying from 2,000 to 5,000 most of the time, and this dairy has been delivering it wholesale.

Dr. C. E. Terry, Jacksonville, Florida.—Many of you were not present at the milk symposium held in the section on hygiene. Dr. Ross, in his remarks about the milk supply at Jacksonville, brought up the point of cleanliness of the general milk supply as a possibility in a community, and the fact that the price of milk was not increased as the result of the enforcement of the milk ordinance. That brings up the point, namely, the necessity in the far South, where dairymen are poor and are not able to have the equipment which the northern and eastern dairies have, of paying attention to methods rather than to equipment. We have not in Jacksonville a single dairy that will compare in any way with the modern dairies of the North and East, and some in this

city. We have no concrete floors in the dairies supplying milk to Jacksonville. We have not a single dairy supplying Jacksonville with milk that would score an equipment of more than 83 per cent. The results we have obtained have been entirely by supervising the methods of the dairymen and by frequent bacterial counts. We make counts on every wagon every week, and publish the scores, not only the dairy scores, but bacterial counts, with a notation in the daily press as to certain ones. We put capital D after dirty milk, and W after watered milk, and carefully explain in a footnote the meaning of these letters affixed to the name of the dairyman. We go further and make up a separate list for the last six or eight months of those dairies going above a certain limit and those which come in the medium class. In this way people are going to shift around from one dairy to another.

I do not know whether Certified milk is a necessity in a community or not, but it cannot be obtained without more equipment than can be gotten in Southern communities on account of cost. Our dairies are small. We have no railroad milk in Jacksonville. The farthest point from which milk comes into the city is 12 miles, brought in a machine. The dairies will average 6 miles from our city, and the milk is delivered to the purchaser. There are two or three milk depots, but they handle but a small portion of the city's milk supply. I believe that it is quite possible to have a community's milk very clean with the most meager equipment in the dairy, provided supervision at the time of milking is carried on frequently and checked up by bacterial counts which are given to the public and newspapers, so that the public can appreciate what dirty milk is and where the cleanest milk is to be found.

Dr. Philip F. Barbour, Louisville, Ky.—Dr. Tuley was too modest to tell you of his connection with Certified milk commission in Louisville. Without his energy and activity we should have had to wait years before obtaining Certified milk. Our Certified milk is of a high grade, running less than five thousand bacteria. As a rule I do not believe that bacteria are the only things that give us trouble in the milk. Our Certified dairy furnishes milk standardized to four per cent fat, also milk from very superior Jerseys, running five and one-half per cent fat. Sometimes they substitute the five and one-half per cent milk, and the mother, not noticing the difference, gives the higher fat percentage, which nearly always makes trouble. Milk should be as uniform from day to day as possible, and this is obtained from using milk from a mixed herd rather than from one cow. High-grade Jersey milk is not so good for children, not only on account of its richness, but because the fat globules are larger than in any other milk. The Jersey is also a very nervous cow. I prefer the Holstein or other grade of cow giving a lower per cent of fat.

Dr. Henry Enos Tuley (closing)—I have been very much pleased at the liberal discussion my paper has evoked and interested in the various points brought out.

It is a pity that there are not more Richmonds and Jacksonvilles, with their ideal market milk. With such wonderful bacterial counts as the speaker from Richmond states the market milk from that city has, the entire city supply could be certified to, but not the year round, as he has interestingly described.

I am pleased that so many mentioned the necessity of education in the homes as to the care of the milk for infants after delivery in the home. Education of the dairymen, distributors, maids in the kitchen, and every one who might handle the milk is most important.

THE IMPORTANCE OF REGULATED REST AND PLAY FOR SCHOOL CHILDREN.*

By James D. Love, A.B., M.D.
Jacksonville, Fla.

Any extensive consideration of this subject must presuppose some familiarity with the important part played in the child's physical economy by selected and reglated diet, as well as some knowledge of metabolic processes as influenced by rest, exercise, temperament, habits and environment. That rest and play are both essential to the mental and physical development of the growing child is a fact so long and universally recognized as to permit of no contention to the contrary. But the proper regulation of rest and play and their proper adaptation to the requirements of the individual child should merit the study and elicit the discussion that belong to a problem too long neglected and but indifferently understood. That only general rules applicable to school children can be laid down, and that consideration of the individual needs and capacity of every child is demanded, are facts that will always render the regulation of rest and play difficult and worthy the consideration of trained and scientific educators.

A casual comparison of few of many types of children will make plain the difficulties which stand in the way of an easy solution of this problem. One type of child economizes energy and conserves tissue, while another dissipates energy, to the loss of both weight and musculature. In one type the anabolic pro-

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cess is abnormally active, while in another the katabolic functions are so overactive as to demand measures to protect the child against actual loss of weight and strength. One type assimilates food and creates energy equal to the demands of the physical organism, while another, through faulty assimilation, accumulates insufficient energy for average daily consumption. The needs of a child possessed of a nervous temperament should be contrasted with the requirements of the phlegmatic child. In one type of school children active physical exercise is needed to utilize surplus energy, while in another rest is demanded to conserve the meager supply.

Were it not for these essential differences in the constitution of various children it would be but an easy matter to lay down dogmatic rules governing the nature and amount of rest and play needful for the growing child. While we know that during the entire span of one's life there is a constant employment of energy and a constant transferrence of it into one or another form of activity, we have as yet no definite rules of guidance which might enable us to conserve energy on the one hand or to dissipate it on the other. We are even powerless to entirely regulate the output of energy during such a period of complete rest as is induced by sleep. For while it may be true as Rubner contends that "in rest the dissipation of heat is the only avenue for the loss of force," yet in order to be entirely true this must imply such complete rest of both mind and body as is seldom secured by the average child even in profound sleep. For I claim that the mental activities often associated with sleep go almost as far as heat dissipation toward consumption of energy. Then if the output of energy during sleep is found impossible to regulate, if it differs with the nature of sleep, if it is greater with the nervous, restless child than with the quiet, phlegmatic child, how much greater becomes the problem of determining and regulating the output of energy during active physical exercise! Weintraud (1) nicely expresses this truth in the statement that "even the restlessness of a patient in bed with increased respiration and cardiac action and mild tremor, as frequently occurs in the susceptible patient, will bring about an increase of oxidation."

A child begins the day with a store of food elements held in combination by potential energy, (2) and whether the child is normally constituted or not, in order to maintain a reasonable amount of vigor there must be a change of this potential into kinetic energy, an accumulation through food intake of new energy, and such an adjustment of metabolic balance as by night there is a reserve supply of energy over and above that consumed during the day. A very active, nervous or underfed child, or one with faulty assimilation, may through play consume as much, sometimes more, energy than is manufactured during the day. Such a child needs its play curtailed and its period of rest increased. Another child of a totally different temperament and nerve fibre, one of the sleek, "sleep o' night" children, who manufactures much energy and also economizes it, may end the day with too great a sum of energy on the reserve side of the scale. This child, in contrast to the first one, needs vigorous employment of his mental and physical functions and a marked curtailment of the period he is too prone to devote to rest. Not infrequently it is a problem in metabolism to determine why one child dissipates and why another economizes energy.

The proper conservation of energy becomes of especial importance in the case of children with tendencies to tuberculosis, and in those who by circumstance and environment are particularly susceptible to communicable disease. Conservation of energy which is usually associated with not only well developed musculature, but a generous amount of adipose tissue as well, cannot be secured unless there is a proper regulation of both activity and rest. No less a personage than Socrates has said that "the strength of the body is destroyed by violence and idleness, but preserved by exer-

cise"; and over-activity of the mind is just as conducive to physical exhaustion as is excessive muscular activity. This is exemplified daily in the cases of those addicted to mental worry, anxiety and sorrow, and even more perfectly in the case of those afflicted with manic conditions (3). On the other hand, too much exercise of the body, and this may be the result of excessive play as well as excessive labor, is invariably at the expense of the mind.

In regulating the play of a school child I presuppose that this regulation extends to both the extent and nature of play, for while one child may participate with freedom in games entailing strenuous activity, another child should be permitted but limited indulgence in such, and for still another they should be altogether forbidden. Fatigue, consequent on over-exercise may, by depletion of vitality, awaken into activity a tuberculosis that previously had as its expression only enlarged lymph nodes. By fatigue the resistance of the poorly nourished child may be so undermined as to render it an easy prey to all infectious maladies. Strenuous play may prove disastrous and even fatal in cardiac disease, while selected and restricted play is to be commended.

In this connection I would quote Dr. Charles Hunter Dunn (4), who states that "we should avoid putting our cardiac patients under a glass cage, for even normal activity is preferable to extreme limitation of activity." He argues for such perfect adaptation between the heart and the patient as will enable the heart to meet the demands made on it. He holds that "by regulated exercises we should constantly increase the amount of activity allowed, and if finally these children can indulge in all the activities of childhood without symptoms, we should not hesitate to remove all limitations." Naturally these children should be under the supervision of a physical director, with sufficient medical knowledge and skill to enable him to properly regulate their rest and play.

The school child with a spinal curvature, with flat-foot, with narrow chest, the hunchback, the mentally deficient, are all as much entitled as the cardiac patient to the supervision of a constant physical instructor. In this connection I would protest against the obviously unjust methods pursued by the physical directors of many of our public schools. One has but to visit the playgrounds of one of these schools to note the discrimination practiced against the very child who mostly needs regulated physical exercise. The physically fit and well-developed boy who scarcely needs the assistance of a director has lavished on him the most patient endeavors of an athletic trainer who hopes through the physical prowess of his young protege that honor may redound to himself and his school. The undeveloped and physically defective child who has been briefly tried and thrown into the discard is from every humane point of view more entitled to individual physical instruction and regulated play than the robust and promising young athlete. The pathetic side of this picture is seen in the wistful, longing eyes, the adulation and hero worship depicted on the face of the little chap who is thus left to his own feeble efforts to work out the problem of his physical salvation. Till the needs and requirements of the school child are studied with a view to developing the weak, conserving the strong and overcoming the deformities of the defective; till the child's capacity for play is measured and his need of rest is considered; till individual instruction and guidance are given these children under competent supervision, we cannot hope for the results that should surely accrue from regulated rest and play.

While many of the foregoing remarks mostly apply to the growing boy, I should deem my duty but poorly fulfilled were I to omit some special reference to the crying need of regulated rest and play as applied to the developing school girl. No one better than the physician can appreciate the menace to future health that attends the transitional period from girlhood to womanhood. We know that this period

is an especially critical one among girls of delicate breeding and that it must be surrounded by every safeguard to insure for her perfect physical development and future health and strength (5). During this period the amount of work and play should be carefully curtailed and regulated. Attendance at school should in most cases cease, exercise and play should be of moderate amount, and above all, a great portion of her time should be devoted to perfect physical rest. The amount of time so lost from her studies can be more than regained at a later period when she has won through these precautions the advantages accruing from ideal womanly development.

'Tis not the province of this paper to recommend the nature of play needful for even the average school child. This can only be ascertained by careful consideration of the individual child's capacity and needs. But I would protest against the coercive indoor gymnastics that constitute a part of the regimen of many of our modern schools. For the most part this is not only distasteful to the child, but is fruitless of the very results that are hoped to be secured. Just as far as is consistent with the needful limitations and restrictions a child should be accorded freedom in the selection of his exercise and play, for, without a doubt, the happy state of mind that attends a pleasing form of exercise contributes materially to the benefits derived therefrom. This especially applies to the normal child who for a great portion of the time can rely on the promptings of nature to select and limit his exercise and play.

Many of our school children are incapable of prolonged and sustained mental effort without serious detriment to what is at best but an unstable nervous organization, and I am sure that for these children the study periods required in many of our public schools are entirely too long. In the minds of many of our teachers the idea still prevails that frequent recesses are forms of indulgence or special privileges to which only the brightest and best behaved children are entitled. I deny the right of any teacher or disciplinarian to select as a form of punishment the curtailing of play which to every growing child is an absolute necessity. I contend that if a child must be denied recess or be "kept in" after school hours as a punishment for acts of omission or commission, then is our system faulty indeed. Desire for physical activity is a predominant trait in every normal child, and associated with this is an equal desire to be amused. I endorse the views of Dr. Kerley (6) that among our school children "absence of proper amusement is the mother of crime," that amusement and play may be made as educational as we like and that play of the right kind is always educational.

I cannot even briefly touch upon the improvement in the morals of the school child that might accrue from regulated and selected forms of play. But that the moral fibre may be refined, ennobling sentiments planted and cultivated, respect for the rights of others inculcated and the foundations laid for the best in manhood and womanhood, by proper adaptation of play to the growing child, are truths generally accepted by all who study the conservation of the child.

In closing I would refer to the absurdity of regulating the rest and play of the school child for eight months of the year and freeing him from restrictions and depriving him of guidance during the months of vacation. Any system of regulation of rest and play adopted by our public schools must, in order to be fruitful of best results, be continued without interruption during the entire period of school life. Neglect of this is, for the ends to be attained, just as irrational as to carefully regulate the diet of a child through the school months, and, freeing him from all restrictions during vacation, accord him free rein for such gastronomic indiscretions as are prompted by the caprices of appetite and fancy. Since it is not to be expected that children can be kept under the constant supervision of a physical director, especially during the months of vacation, it is necessary that parental co-operation be secured in order that instructions as to

regulated rest and play be carried out through the entire year. Public playgrounds have become a recognized essential in every large community and could be as appropriately utilized in the smallest towns. On every one of these playgrounds a clubhouse might be built and used not only for indoor amusement and physical training, but as a place for individual instruction of parents and children as to the nature and extent of play and the amount of rest suitable for every child. That this would redound to the physical and moral welfare of the future men and women of our republic must be evident to all who would give this even casual consideration. Such a system could be maintained only through state and municipal aid, but should be productive of good out of all proportion to the expense involved. I am in complete accord with Dr. Kerley in that "what we need most of all is a 'child protection commission' which through its subordinates would be required to know and to have authority over every child in the state."

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THE IMPORTANCE OF MEDICAL INSPECTION OF SCHOOLS.*

By Philip F. Barbour, M.D.,
Louisville, Ky.

"Where a parent delivers his child to their care he has a right to insist that the child under the supervision of the school authorities shall be safe from harm, and will at least be handed back in as good condition as he was before. If the parent does not claim this right, the child has a right to claim it. Where a State for its own protection compels a child to go to school, it pledges itself not to injure itself by injuring the child." This sounds almost axiomatic, and yet there is only one State in our Southland where the medical inspection of school is mandatory, and in one other State permissive. "My brethren, these things ought not to be so." Massachusetts was the first State in the country to require medical inspection, though it had been practiced in a number of the leading cities before its statewide requirement in 1906. Even at that this country was more than twenty years behind its introduction in Belgium. Public interest and public conscience have been aroused more and more each year, and now we find that a large number of the important cities have come to a realization of what it means to the health of the children of the city and have established systems of examination and inspection more or less complete according as public opinion has been aroused and educated. There remain, however, vast territories in which no adequate attempt is made to conserve the health of the school child, and the medical profession must be aroused to take a strong stand far in advance of their communities and wage a warfare for the child to establish its right to a healthy childhood, so that it shall not be made to run the gauntlet of contagious diseases, which take toll not only of life but also of the physical powers and senses which are so necessary to the enjoyment and success in life.

The public, as well as the profession, are coming too slowly to the opinion that disease is often wholly unnecessary. It is only the ignorant mother who now believes that it is necessary and, in fact, profitable for her child to contract all the contagious diseases as soon as possible so as to get through with them. Now that we have that snake about scotched, Christian Science lifts its hydrahead and denies the very existence of disease, contagious

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or any other kind. It behooves us to take up arms to defend the helpless child.

Medical inspection for the detection of contagious diseases was the most obvious and most easily accomplished object. Hardly any sane person in these days would deny the value of inspection in stamping out the contagion in the school of the most dreaded contagious diseases such as diphtheria, scarlet fever, smallpox. When one considers that smallpox can be so easily prevented by the simple procedure of vaccination and that diphtheria and scarlet fever are not only far less apt to attack adults, and when they do are not accompanied by certain dangers which inhere in the young child, there can be no question as to the value of an inspection which can limit the prevalence of these diseases. When diphtheria breaks out in school it is wise to make cultures from the throat of the children that were the closest associated with the sick child, and in this way the spread of the infection can be easily arrested. The health board activities vary in different cities in the thoroughness and efficiency of the measures which are to be instituted to combat any contagious diseases which have arisen, but the knowledge of the presence of such a case of infectious nature is the opportunity to quarantine and take such other measures as may be within the power of the board.

In addition to these more severe and dangerous diseases there are a number of other milder affections which fall within the province of the inspector, though the usage is different in the various cities. The laity are slow to grasp the great dangers and real suffering attendant upon whooping cough. Even physicians are sometimes slow to realize the actual number of deaths from this disease, not taking into account a great number of dangerous and distressing complications and the very grave predisposition to tuberculosis attending upon this disease. Measles, mumps, chickenpox, tonsilitis, trachoma and other eye diseases have been gradually added to the list.

It is only a small step from those more serious affections to another group which may be far less dangerous but which may cause a deal of unpleasantness. I refer to the group of parasitic diseases, scabies, pediculosis, ringworm and impedigo contagiosa. Any one of these can produce an amount of discomfort far out of proportion to its seriousness. It is fortunate that all of these can be recognized by the trained eye with great ease.

It is hardly necessary before this company of leading men in the medical profession of the Southland to try to prove that the number of cases of infections can be lessened by careful inspection of its schools, although there are many other avenues by which contagion can be conveyed beside the public schools. In Louisville the parochial schools and Sunday schools have not been under the operation of the law heretofore, though our splendid health officer is hopeful of seeing this accomplished shortly. It is a common practice to find children who have been excluded by reason of some other child's being sick in the family, going to some private school until the quarantine is lifted. It is a pity that the moving picture shows could not be put under some such health restriction and I am sure that some cases of contagious diseases have followed immediately upon the visit to the circus.

The statistics of Boston have shown that since the system of medical inspection of schools was introduced there diphtheria has fallen off about two-thirds and scarlet fever about five-sixths, and that after inspection was introduced contagious diseases were less common during the school term than during vacation.

From the examination and recognition of the contagious affections it is not a very far step to the examination for certain bodily defects which in one way or another affect the child's progress at school. Outside of the emotional suffering when one's child is seriously sick is the economic loss to the family from the necessary expenses incurred in what is often an unnecessary illness. One does not often reflect that there is an economic loss to the

public school system in the lost time of the child which has to be made up in some way. This may not amount to much, but when multiplied by the thousands that attend the public schools in our large cities it will amount to very significant figures. One need not deny or impugn the altruism of our public school system, but open air schools are fundamentally economical. The need of this new departure in the hygiene of the school has come from the broadening of the conception of the work of an inspector. The recognition of bodily defects has come to be a part of the inspection. The rescue work of medical inspectors in bringing to the attention of the teacher the far-reaching influence of defects in the sight and hearing would alone be well worth the whole cost of the inspection. The recognition of adenoids, chronically inflamed tonsils, otitis, and kindred troubles has meant a new life to thousands of children and has rolled away one of the great burdens of the overworked teacher. All of us know of cases of dull, stupid children that have been awakened into a new world by the removal of adenoids and tonsils whose presence had not been appreciated by the teacher or the mother.

Dentistry has also increased our knowledge and pointed out to us the interference with health that may and does come from carious teeth. Imagine trying to learn the multiplication table while suffering with the toothache or a swollen jaw. It is not so many years that we have appreciated at its true value the menace of pyorrhoea to the gastro-intestinal system and possibly other more remote but even as important recondite effects. Free dental clinics are being organized in all of the larger cities as a very important adjunct to the work of medical inspector. The public and perhaps the doctor himself needs education along this line.

The mentally backward or dull child has always been one of the trying experiences in the life of the teacher. Many times the teacher has not known that the backwardness was the result of physical rather than mental, or perhaps moral defect. The experienced medical inspector may recognize a profound anemia, or an underlying heart or lung pathogeny, that would yield to proper treatment and has saved the child to the State by making its education possible. Schools for backward children with proper attention paid to the physical weariness and shortcoming of the child have had most wonderful and encouraging results in cases which, to the teacher, have been hopeless. Of course the recognition of the low grade types of mental defect, the congenitally feeble-minded, the Mongolian, or even the high grade Moron should be within the province of the medical inspector.

In 1903 New York began a work of complete examination of the child. The height and weight are noted which are valuable in arriving at an opinion as to the general vitality of the child. The record blank requires answers to more than forty questions, and while of the greatest value in the way of records of and for the child during its whole school life, yet it is not feasible except in the large cities where the school inspector force is large and paid enough to put in the required time. Louisville has four inspectors to approximately 30,000 children in public schools. The following diseases are excluded from school: Scarlet fever, diphtheria, measles, whooping cough, tuberculosis, chickenpox, smallpox, mumps, conjunctivitis, spinal meningitis, scabies, impetigo contagiosa, pediculosis. The following defects are noted when found: Defective teeth, defective vision, enlarged tonsils, adenoids, skin diseases, anemia, defective nutrition, enlarged glands, defects in hearing, pulmonary diseases, nervous diseases, defective nasal breathing, defective mentality, malnutrition, heart trouble, deformities, tubercular diseases.

It happens many times to the physician to be consulted about some trifling condition and find that there is some serious disease present about which the patient has been in profound ignorance. One function of the medical inspector is the recognition of morbidity and the

sending of the child to the family practitioner for proper relief. The medical inspector should under no circumstances prescribe for the child or assume any of the duties of the family physician. But it is important and necessary that the recommendations of the inspector be carried out. To send a child home for the itch and have nothing done for it is simply depriving the child of its education. In order that the suggestions shall be carried out it has been found necessary to have school nurses detailed to follow up the cases. The tactful nurse can enter the home and accomplish her purposes where the physician would be considered to have exceeded his authority. The school nurse is almost as important to the success of the inspection as the doctor. There is not the antipathy on the part of the poorer classes to the nurse that we find to the doctor, and they can reach the children and watch the treatment and follow the case in a way not possible to the physician.

In conclusion one might say that the position of medical inspector is one requiring abilities much above the ordinary. He should have had much experience with children's disorders, a working knowledge of skin diseases, which would enable him to recognize the contagious from the non-contagious with facility. Some special ability in the matter of eye, ear, nose and throat work, and training along those lines would save embarrassment. He should be familiar with the psychology of children and know something of their average mental capacity. He should be broad enough to understand the problem of the teacher that he may help and advise her as to the best way to handle the individual case. It has been estimated that only 9 per cent of physicians have had an education above the graded school, and one can understand that this work can be performed to the best results only by a man with the preliminary education adequate to the work. The medical inspector should be paid a salary commensurate with the experience and special knowledge which he should have acquired, and which are necessary to make a good inspector.

DISCUSSION OF PAPERS OF DRS. LOVE AND BARBOUR.

Dr. T. Frazer, Asheville, N. C.—The importance of medical inspection of schools may be illustrated by the following: Several months ago we had an epidemic of diphtheria in Asheville. Of twenty-five children examined at the Asheville Free Dispensary and found to be carriers, there was not one who did not have some lesion of the pharynx or naso-pharynx. More recently the necessity for systematic examination of children impressed me. Six weeks ago we had a "Better Babies' Contest," held in connection with the North Carolina Agricultural Fair and under the auspices of the "Woman's Home Companion." The children were between six months and three years of age and entered as they were, with the hope of securing a prize, they were on the whole a very healthy looking set of children. There were nearly 250 entries, yet of this number fully 90 per cent, I should say, had some lesion of the nose or throat, or enlarged cervical glands. If this is the case among the supposedly healthy children, what must it be among those in unfavorable circumstances?

Dr. Arch Dixon, Henderson, Kentucky.—I am very much interested in the medical inspection of schools, and have been for some years, and I have made earnest efforts to get medical inspection in my town, but I am sorry to say that my town, and many other towns, when it comes to the question of money, does nothing. Three years ago I made an effort to get medical inspection of schools. We had about that time an epidemic of scarlet fever, which lasted for two or three months. A few of our doctors agreed to go around and inspect the schools themselves, but that amounted to this: Three or four of them went once or twice and the whole matter was dropped. In talking this matter over with members of the school board I asked if we could have the privilege of taking in each of the public schools of the town one or two teachers who were willing to do this sort of work, and give them a certain amount of instruction so as to recognize defects of hearing, throat troubles, defects of eyesight, taking temperature, and see if a child had fever, or recognize any child that was not normal or well, and in that way look it over and see if the child was normal or not. If a child was not well or was abnormal it was immediately to be sent home, with a note to the parents that the child was not well and that it should be under the supervision of the family physician. I am glad to say that plan has worked very much more satisfactorily than I really believed it could. The teachers have taken great interest in the work. We have two or three lady teachers who can recognize adenoids; they can tell whether the tonsils are involved or not. They know when a child has fever; they can take the temperature, or tell if there is any eruption. Sometimes the children complain of having trouble with the face due to some disturbance about the teeth. They send such children home, but oftentimes the family physician is not called in at all, and the mothers get mad because their children are sent home. They do not like it. Some day I hope we will have regular medical inspection of schools, as I think it is very important. North Carolina

has set the pace in requiring whole time health officers, county and city, to inspect her schools. Every state should adopt the North Carolina method until they can do better.

Dr. McGuire Newton, Richmond, Virginia.—I wish to emphasize what Dr. Barbour said with respect to the medical inspection of schools, that the inspectors should be trained, experienced men. My observation is that where medical inspection is indulged in or undertaken the city authorities select men for medical school inspection who work on small salaries. They have had no experience with the children or with people, and the result is they bring medical inspection into disrepute. In the city with which I am connected inexperienced, underpaid medical inspectors are doing harm. I would rather have medical inspection carried out by an intelligent teacher, who has been told two or three things about medical inspection, than medical inspection by the underpaid man who reports circumstances as a city physician, who is looking for an opportunity, but who in nine cases out of ten is fresh from college and creates trouble. It is up to us as medical men to urge for medical inspectors salaries commensurate with skill, and then we will get men and medical inspection of value, but not until then.

Dr. J. D. Trawick, Louisville.—In following the thought of Dr. Newton, that the medical inspector ought to be a competent man, and still further emphasizing a point Dr. Barbour made in his paper, I want to call attention to the fact that the medical inspector will become a competent man when the community demands it. The medical inspector is like a great many others with reference to the social factor in the community, he needs instruction. This is pre-eminently an era of child culture. We are paying much attention to the matter of the conservation of the child. Consider the child, not simply as an individual, but as a being in which there is a combined mass of potentialities. We are realizing the surroundings of the child are going to add culture to the child, depending absolutely upon what has been put into it by its forbears. In other words, the character of the child with which it has been endowed has to be molded after he is brought here. I think we are all agreed that the home, after all, is the chief place where these moulding influences must begin. The medical inspector can in no way take the place of the home, but it is necessary for him to supplement that which the home may in part supply. A particular point should be emphasized, that the medical inspector should not simply be equipped to make a diagnosis of scabies or sore throat, enlarged tonsils, and various ills required to be reported, but ought to be capable of recognizing many other factors in the psychology of a school child. For instance, fatigue, as it relates to the effect upon the child. Physicians have the power of moulding a community of sentiment in regard to this matter of efficient medical inspection of school children.

Dr. Louis Leroy, Memphis, Tennessee.—Undoubtedly this is one of the large subjects before the profession today. As Dr. Trawick has said, this is an age of child conservation and development. I believe that the worst common school inspection is better than no school inspection. Even though the inspection which we may be getting in some localities savors a good deal of political preferment, and the work is carried on by incompetent people, with some little municipal aid, and by not always the best men in the community, still it is better than no inspection whatever. If such inspection should be the means of sending one case of diphtheria home in a year, or one case of small-pox in a year, it has not been in vain. Attention is not alone to be directed to inspection of school children, but we must direct our attention to the inspection of medical students. If we inspected medical students a little more thoroughly and saw they were equipped before we graduated them, there would not be so much unfavorable comment heaped upon the younger man because he chances to be a young man. There is no reason why a good recent graduate from a good school, if he is a man of sincerity, should not be well equipped for medical inspection of ordinary schools. He may not have the judgment that an older man may have. He may not have the skill an older man might have; he might make some errors where a difficult dermatological diagnosis has to be made, but he can see that there is something present which does not belong there and send the child home. He can tell whether there is a cardiac derangement, a temperature derangement, or matters of that sort reasonably well. We cannot expect, especially in our larger cities, to give a most searching, thoroughgoing, complete examination of all conditions, but we can apprehend most of the contagious diseases.

There are two or three points we should look into in the near future along the line of school inspection. One is the inspection of the renal condition, which, as a rule, is never paid attention to. There are many children running along with subacute nephritis following some of the exanthematous diseases which are overlooked. At any rate they could be determined and caught up with. Some of our anemias, some of our early fatigues, some of our incompetence in children is due to a subacute renal derangement which they may have and which may be overlooked. Another one is the wasting of nerve energy perhaps by irritation caused by phimosis and allied conditions, either in the male or female child, and that, so far as I know, has been ignored totally in connection with school inspection. Phimosis is a condition which is much more frequent than we are inclined to suspect, and it is either overlooked or it has not been considered at all.

One more point is this: In many of our locations we should screen our school rooms and wage war against mosquitoes. We breed mosquitoes, we send malaria carriers there, and we reinfect one child after another. In this latitude is it not fair to expect to examine each one of the pupils each fall to see whether or not they are malaria carriers, and then apply hygiene to the screening of the rooms and getting away from cisterns, pools, puddles, and various mosquito breeding places? These are three things to which subsequent school inspection must look.

John A. Ferrell, M.D., Rockefeller Sanitary Commission, Washington, D. C.—The interest be-

ing shown here in the subject of medical inspection of schools and school children is very gratifying to me. This work will be put on a sound basis when whole-time health officers are employed, who make preventive medicine their professional work. The discussion here and in other conferences I have attended applies more largely to the children of cities than to those in the rural communities; yet, here in the South, from two-thirds to four-fifths of the entire population is found in the rural sections. Something must be done to provide adequate medical inspection for the country child as well as for the town child. The obstacles to putting this work on a firm oasis in rural communities is even greater than will be met with in towns. It should be undertaken only by the best trained medical men, whose training has been along the lines their work will carry them. The health officer should be able to enter a schoolroom and place himself on an equal footing with the teacher, to instruct both teacher and child in the essentials of medical inspection. In the South considerable attention is now being devoted to the employment of whole-time health officers. North Carolina, for example, now has twelve, whose jurisdiction reaches something more than one-eight of the State's territory. They are among the best men in the State, and are paid from $1,600 to $3,000 per year. Their duties include the medical examination of school children, the sanitary inspection of school premises, the lecturing to teachers, and so on. Their work is already demonstrating the practicability of having medical inspection in rural counties. It is unwise, however, to attempt the creation of a new county office and the employment of a whole-time health officer to fill it until much educational work has been done among the people, and the right kind of public sentiment created.

When a reasonable number of these health officers have been employed, each works in a way which seems best to him; they hold conferences, and ultimately adopt a more or less uniform system of work which will yield the largest results. When this is done, I think the wisdom of having the whole-time health officers will be so thoroughly demonstrated that the idea will spread rapidly, and we hope within a few years to see efficient health work done, even in the rural communities, by permanent, skilled, well-paid agencies.

Dr. Brooks F. Beebe, Cincinnati, O.—It does not seem to me that there is any great need for prolonging this discussion, because there seems to be unanimity on the subject. It is a great deal more important if we were to do what the last gentleman suggested, namely, to have a teacher for the teachers, and still further I would add a teacher for the community along medical lines. It is a strange thing that it takes so long for the medical profession alone to appreciate the value of human lives. Have you ever figured out that the average human life is estimated anywhere from $3,000 to $8,000, according to the earning capacity, say on an average of $5,000? You can present this subject very nicely to the community, and if you will put it on dollars and cents lines they will catch it quickly. For instance, it will average the country over, I think possibly the world over, that one-seventh of the population will die from tuberculosis alone. Let us take this city of 50,000 people. One-seventh of them are going to die from tuberculosis—a curable disease. Multiply that by 5,000, and you have pretty near if not fully the entire tax duplicate. This is only one disease that comes in the category of acute infectious diseases, and is preventable. You can figure it on the basis of dollars and cents, then the community will get some idea of the value in reduction of taxation and things of that kind in addition to the reduction of suffering and unhappiness. This is largely a matter of ignorance on the part of the community and not so much among physicians. Children of such parents are little degenerates—no, I won't say degenerates, because it is sometimes impossible for a child to be worse than the "daddy," but I will call them defectives. These defectives are brought into the world largely through the ignorance of the people, and not so much so of the physician. People will not permit the physicians to do as many things as they know should be done. It seems to me that if we can get at the people, even in the country schoolhouses, as in the larger cities where we live, we can educate them as well as we can any place else. In one of our counties in Ohio when I was one of the councillors, we had popular medical meetings once or twice a year, and it was astonishing to observe how we could educate the community through the teachers and preachers, lawyers and laymen, by means of these visits and talks of the physicians. Ordinarily, it is understood in the average community, that the physician does not amount to much except for peddling pills and powders. If he puts himself forward, as he should do, he should be a great educator in the community, and there is no question but that this whole subject of degeneration and the spread of infectious diseases of which we are speaking should be brought to the attention of the people more than to that of ourselves.

Dr. Smithfield Keffer, Milford, Ky.—I have noticed in connection with what has been said regarding school inspection that the children are found to have defective sight and hearing. I once taught school in this State during which time I had ample opportunity for observation, and I always noticed that if boys and girls did not pay any attention to what I was saying I found that they were generally defective in hearing or in seeing. I do not believe anyone has referred to that particular phase of the subject, but it is one that should be carefully considered. Many children are sent to school that ought to wear glasses, or they ought to consult a specialist in diseases of the ear for ear trouble. I do not believe a child can degenerate very much when it is already defective, and we ought to do something for these defectives, many of whom we have in our Southland. They have them in the North as well. The worst defectives I have ever seen were in the city of New York, but we have reached a point where something should be done to stop this.

Dr. James D. Love, Jacksonville, Fla.—In connection with Dr. Barbour's paper there are a few figures I would like to give you which relate to the work done in Jacksonville in the way of medical inspection. These figures cover the year 1912-1913. Of 3,200 pupils examined during the

year, 2,472, or more than three-fourths, were found to be defective. The report named the principal defects found in these children. These figures speak more eloquently than I possibly can in the way of emphasizing the importance of medical inspection of schools. I agree with Dr. Barbour that notwithstanding children love to attend circuses and derive great pleasure from them, the harm that is done in the way of spreading contagious diseases in the community far outweighs the benefit the children derive from it.

Dr. Philip F. Barbour, Louisville (closing the discussion)—The city of Louisville has voted a bond issue of $1,000,000, a large part of which is to be devoted to purchasing additional ground for the school children to play in.

THE IMPORTANCE OF PEDIATRICS AS A SPECIAL STUDY.*

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First of all, Mr. President and members of the Southern Medical Association, I wish to thank you most heartily for the honor you have conferred upon me by inviting me to address you on this occasion. It is a great pleasure to me to be present at the inauguration of a session devoted especially to a consideration of topics relating to the hygiene and the diseases of infancy and childhood. Your President asked me to speak on some general topic pertaining to diseases of children, and so I have chosen as a subject "The Importance of Pediatrics as a Special Study."

I would invite your attention not so much to the study of pediatrics as a specialty, as to the importance of special interest in and attention to pediatrics. It has been said, and with some truth, that devotion to a specialty narrows a man's vision; but pediatrics is not that sort of a specialty; it is one that, on the contrary, tends to broaden a man's medical vision and interests; for its problems involve the fundamentals of life and society.

Pediatrics means the study of everything that pertains to the health of the child—its hygiene, feeding and management during the formative years, and the treatment of the disorders and diseases that arise during this period of life. It is therefore a widely inclusive study; having the closest relations to general medicine and surgery, as well as to obstetrics. Subjects that are intimately allied to pediatrics are the questions of heredity and its modern synonym, eugenics, the care of mothers during pregnancy and childbirth; the promotion of maternal nursing; proper housing; proper schools; length of school hours and time for luncheon and medical school inspection; provisions for playgrounds and parks, and the procuring of good, clean milk. Have you ever thought of the improvement in the general milk supply since the physicians most interested in children began this campaign for pure milk for babies in order to promote their careful feeding? Nowadays medical milk commissions are very numerous—and all because the medical profession as a whole is interested in proper infant feeding. The campaign for better milk for babies has improved all the milk supply and has greatly lessened the danger of milk-borne epidemics among adults as well as among children.

Pediatrics, therefore, is a broad study; it is one, moreover, in which for best success the physician should have a fondness for, and consequently a sympathy with, children. It is wonderful how much more of himself a child will unfold for inspection and study if the physician brings with him a friendly and genial, though authoritative atmosphere.

Special attention to the study of pediatrics is important for the general practitioner.

First, because such a large percentage of his patients are children. It has been well said that pediatrics is the specialty of the general practitioner.

How important pediatrics is may be judged from the fact that in 1910, out of a population of 91,000,000 in the United States, nearly 19,000,000, or more than one-fifth, were children under fourteen years of age; there were 10,-

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000,000 under five years, and 2,250,000 under one year old. Of the 600,000 total deaths in the registration area, more than one-sixth, or 100,000, occurred in infants under one year, and more than one-fourth in those under three years of age. Moreover, the amount of illness or morbidity is, of course, greater than at any other period of life, embracing as it does the disorders of nutrition, gastro-intestinal disease and the contagious diseases of childhood.

In regard to the relative number of cases of disease in childhood which the general practitioner is called upon to treat, it may be of interest to know that at the Vanderbilt Clinic in New York, the proportion of children among the medical cases has for years been about one-third, counting as children those under twelve years of age. At the Boston Dispensary, which is the oldest institution furnishing medical aid to the poorer parts of the city of Boston, it has been found that children are the source of about half of the house visits made by the district physicians, and in the out patient, or ambulatory department, children form the largest single group.

Another feature increasing the demand for physicians competent to deal with infants and young children is the fact that these little patients become so suddenly and apparently seriously ill with conditions that in adults would scarcely cause an indisposition. As a consequence very often a physician is called to see a child with an illness that in an adult would require no treatment. Careful study of the case and an accurate diagnosis, however, are exceedingly important since really serious conditions may be present or may rapidly supervene. One might mention especially otitismedia as a cause of obscure fever, often with severe nervous symptoms, and very commonly mistaken for teething. Also one must mention intussusception, byelitis, and acute gastro-intestinal disease, the last at times simulating appendicitis.

Moreover, the field of strictly medical work in pediatrics is very wide, bringing the physician into intimate relations with such other specialties as dermatology, neurology, laryngology, ophthalmology and otology, and with the peculiar series of blood conditions and other matters of interest in clinical pathology. When I had charge of the Children's Department of the Vanderbilt Clinic it was not infrequent for us to consult with or be consulted by everyone of the various departments mentioned in a single afternoon. There is no better way for a physician to keep in touch with all the various medical specialties than by working in a children's clinic and studying each case carefully.

In the second place it is most important for physicians to devote special attention to pediatrics for the sake of the little patients themselves. Many disorders and diseases appear only in infants and children, and many others have features that are peculiar to children. The physician who can make an early and correct diagnosis will prevent a great deal of suffering and much loss of life. There is in general a high susceptibility in infants and young children to nervous and cerebral disturbances evidenced by the ease with which they become delirious or have convulsions, and there is also a very unstable condition of the heat regulating center, so that the temperature is easily raised to a high degree from comparatively slight causes. Occasionally a marked depression of the temperature is met with.

Examples of diseases found with especial frequency or exclusively in childhood are all the acute eruptive diseases, together with whooping cough and mumps, also the hemorrhagic diseases of the newly born, intussusception, pyloric stenosis of either the spastic or hypertrophic form, status lymphaticus and enlarged thymus gland, rachitis, scurvy, cyclic vomiting, acidosis from poisoning by cream mixtures, and the various nutritive disturbances that have been described recently so completely by Professor Finkelstein, of Berlin.

As examples of peculiarities of diseases in

children and their unusual susceptibility may be noted the frequency of delirum in fever, of convulsions (which may be repeated) at the onset of pneumonia, tonsilitis, or gastro-intestinal intoxication; the occurrence of opisthotonos due to pneumonia of the upper lobes or to otitis media; the presence of Cheyne-Stokes respiration simulating tuberculous meningitis in cases of acidosis; all of the above without any actual inflammation of the brain or nervous system. Wide and volatile changes of temperature from slight causes have already been alluded to. I have seen a range from 106 degrees F. to 94 degrees F. in thirty hours without any serious results. This enormous fluctuation occurred in a case of influenza in a baby fourteen months old.

Physical signs are often difficult to elicit and are frequently different in children, but without clear physical findings the temperature must always be an unsafe guide. Infantile diarrhoea and pneumonia, infantile spinal paralysis, influenza, rheumatic fever, which nearly always affects the heart instead of the joints, otitis media, and even acute rhinitis, all show physical signs and symptoms different from those they present in the adult. I have seen a child really prostrated with a fever of 103 F. from a simple cold in the head without any involvement of the ears or the sinuses. It cannot be too often emphasized that in manifestations of disease and in the management of nutrition and drug treatment the baby must not be regarded as a small adult. The baby's organism differs in the quality of its reactions to food, to diseases and to drug treatment, so that a different standard must be kept in mind all the while in dealing with these little patients. Homesickness or the loss of a favorite nurse may so change the nerve control of the alimentary tract that the child may begin to lose weight even though the quantity and kind of the food, and the mode of life remain otherwise exactly the same. Even a little baby's vegetative functions are affected by the nervousness or the placidity of the mother or nurse.

Failure to make a correct diagnosis in infants and children is generally due to a lack of thorough examination. And, in the examination, it should be remembered that the ear speculum often gives more important information than the stethoscope.

The most important problems, however, that the pediatrist is called upon to deal with are those of infant feeding and infant hygiene. It is in the field of infant feeding that pediatrics is most truly a specialty and it is this field that will most abundantly repay cultivation by the general practitioner. No adequate discussion can be made of even the principles of infant feeding in so short a paper as this, but at least a statement of the principles generally accepted at the present time can be given.

(1) First and foremost it cannot be too often reiterated that good breast milk is the best as well as the ideal form of feeding. But even good maternal nursing must be intelligently supervised, lest the baby be sick by overfeeding through too frequent or too long nursing. From human milk the baby gets no foreign albumin to put an extra burden on the intestinal epithelium, and in addition to proper food, which is not irritating to the gastro-intestinal tract, the breast-fed baby does get from the mother protective bodies that render it less liable to contract disease than is the bottle-fed baby.

(2) If the baby cannot be nursed entirely, mixed feeding, that is, partly from the breast and supplementary feedings by bottle, is the next best method. By having the baby nurse first and take the bottle afterwards, the normal stimulus is given to the breasts to keep up their activity, and the mixture of breast milk and modified cow's milk is more digestable than a whole meal made of cow's milk mixture. The breast milk helps to put the alimentary tract in a better condition to digest the cow's milk.

(3) For artificial feeding the best substi-

tute is modified cow's milk. Only the cleanest, freshest milk, and certified if possible, should be used; and the formula should be adapted to the size, activity and digestive capacity of the baby.

(4) The total quantity of liquid in twenty-four hours should be from 150 to 200 cubic centimeters per kilogram of body weight, or, in other words, the baby should drink each day an amount equal to from one-seventh to one-fifth of his weight. This food should be distributed through the twenty-four hours at the longest intervals consistent with the capacity of the baby's stomach and the comfort of the baby. For many artificially-fed babies every four hours is a proper interval. For others, especially small babies, intervals of every three, two and one-half or even two hours are much more satisfactory until the stomach capacity becomes greater. It may be remarked here that the stomach capacity of any given baby can be determined only by trial, and it will then vary with the nature of the milk mixture which is prescribed.

(5) The nutritive solids of the food are the proteids, fats, carbohydrates and salts. The proteids are the most important, since they alone furnish material for growth and they should constitute from 7 to 15 or 20 per cent of the total caloric value of the food. Roughly, the baby should be receiving for each pound of weight the amount of proteids represented in from one to one and one-half or two ounces of cow's milk. The total calories in the food should be sufficient to supply energy for the maintenance of life, for growth and for activity. This is roughly from 45 to 50 calories per pound for young infants. The exact figures for the caloric requirements in accordance with the surface area can easily be worked out from Dr. Howland's simplified formula recently published. The carbohydrates and fats will be used to complete the total number of calories required, it being kept in mind that the fat of cow's milk is somewhat difficult to digest, and is often the cause of vomiting or diarrhea, and occasionally will give rise to serious acidosis. It should be remembered also that of the various carbohydrates, maltose is the most easily absorbed, but unless combined with starch or dextrin it may ferment too rapidly and may give rise to diarrhea or the formation of gas. Milk sugar, cane sugar, maltose, dextrin or starch may be used separately or in combination, watching meanwhile the effect on the stomach and the bowels and the general comfort of the baby.

(6) The formula advised should be as simple as possible for the benefit of the mother as well as for the ease of the physician. Complex mixtures and elaborate or algebraic computations soon consign the baby to the simpler methods of the proprietary food circular. We should take a leaf out of these commercial books and make simple dilutions of milk, skimmed milk or top milk, to which the needed amount of carbohydrate is added. The mixture may then be left raw, or it may be pasteurized or boiled according to the character of the milk and the condition of the stools. Weekly or semi-weekly weighings, together with a study of the baby's digestive symptoms and of the stools will serve as guides to the changes in the food, especially in regard to which food ingredient is to be increased or diminished. The great contribution of the percentage method of feeding has been that it showed us the possibility of varying separately the fats, the carbohydrates and proteids in the prescribed formula.

So much for healthy infants. When we consider babies suffering from gastro-intestinal disturbances we must bear in mind the very valuable researches of Czerny and Keller and of Finkelstein.

Food injury, especially damage done by excessive fat or by sugar, is the main cause of ordinary gastro-intestinal disorder. This is most commonly due to overfeeding. If the food injury goes on unchecked, serious metabolic disturbances may supervene, leading to

rapid loss in weight or even to death. Or, on the other hand, bacteria may enter upon the scene and produce lesions in the intestinal mucus membrane which then assume the chief role and persist in spite of the establishment of a proper dietetic regime.

The greatest resource we have in the treatment of severe diarrhea is the Eiweiss milk, or, as it is called in this country, the albumin or protein milk devised by Finkelstein. Consisting as it does of a high protein and a low whey and sugar, with a moderate amount of fat, it checks very rapidly the fermentative diarrhea and permits us to omit the purgation and the starvation period that so greatly increased the loss of weight in these cases as formerly treated.

Recently there has been renewed interest in the effort to determine from a bacteriological study of the stools what type of bacterial infection or fermentation is predominating. Further than to learn that in simple diarrhea there is an especial type of fermentation affecting the fats and carbohydrates, or an alkaline type of putrefaction affecting the proteids, but little of practical value has been brought out. In the infectious diarrheas there may be one of the Shiga group of dysentery bacilli as the cause of the inflammation, or the infection may be due to streptococci, gas bacilli, or according to some observers, even to colon bacilli. Treatment by means of cultures of bacteria supposed to be antagonistic to these germs has been tried, but with the exception of the use of Bulgarian lactic bacilli, it seems to me there has been little proven of any advantage. If the lactic bacilli are to be used they are best given in milk previously sterilized, then combined with the Bulgarian bacilli and incubated for twelve to twenty-four hours. Tablet preparations of the bacilli, because frequently inert, are not satisfactory. The study to find predominating flora in the intestines should be pursued, however, as it promises to give useful information in regard to the dietetic treatment as well as to the possible benefit of bacterial cultures.

With prolonged or difficult cases of intestinal or gastric indigestion in infants careful study of the digestive symptoms and of the stools, together with a knowledge of all our resources is absolutely necessary for successful treatment. Often breast milk is the only salvation, and it should be resorted to much more frequently than it is. Once I had to put a child back upon breast milk who had been weaned for five months and who had already cut eight teeth. The change proved life-saving after other resources had failed.

In addition to the careful management of the feeding in these cases of nutritional disorder one must not forget the general hygiene of the baby, particularly with reference to fresh air, sunlight, quiet sleep and freedom from excitement and from too frequent, well meant but misdirected attention. In hospitals it is probable that the so-called "hospitalism" of young babies is due largely to the lack of "mothering." Here the babies are left for too long a time lying in their beds and they fail to receive the normal amount of manipulation and massage, of comforting change of position, that is given in every baby's true home.

The other great department of pediatrics to which physicians should devote more attention is *infant hygiene*. A stream can rise no higher than its source. If the nation's mothers and nurses are to take intelligent care of our babies the physicians of the nation must have a thorough and practical knowledge of the babies' needs.

Those who come in contact daily with babies in comfortable or luxurious homes, as well as with hospital and tenement house babies, see constantly the evil results of bad or misdirected feeding and care, and for them no argument is required as to the need, in every medical school and hospital, of special instruction in infant hygiene. For those, however,

who do not appreciate the ramification of the subject, a few important considerations may be mentioned.

Special education in infant hygiene is a necessity, because, in the first place, the mortality among infants and young children is higher than at any other period of life. More than one quarter of the total deaths of the community occur in children under the age of three years. From 10 to 25 per cent of infants born alive die during the first year, 7 per cent more during the second year, and 3 per cent more during the third year; so that, of 100 new born babies, from twenty to thirty will be dead, under ordinary conditions, by the end of the third year. This is bad enough, for even an old man of 84 years has a better chance of living another week than has the newly-born infant. But if we should add to these deaths the 5 per cent still-born, and the large number of pregnancies (about one-fifth I am reliably informed) that result in miscarriages, the figures of infant loss are simply astounding.

Knowledge in infant hygiene will save babies' lives by lessening infant deaths.

A second reason for special attention to infant hygiene is, that the public needs and demands physicians who are well instructed in the care of babies. The birth rate among the better classes of every civilized nation is diminishing, and this makes the individual baby, if possible, more precious to the family and to the State. Moreover, physicians are needed for the increasing number of milk stations and consultations for infants as well as for special babies' clinics and hospitals. At present it is difficult to find medical men with the proper training and experience for this work, and philanthropic societies in many of our cities are already complaining of the poor medical advice given in their infant welfare work.

In this connection must be mentioned the need of nurses trained in infant hygiene. There is an immense and growing demand for such nurses. A wave of interest in social welfare work is now spreading over the whole civilized world, and now, in the United States, almost every small town has its social service bureau, with one or more district nurses. The principal work of the nurses relates to childbirth, infancy and the diseases of childhood. The weakest link in this chain of philanthropy is the dearth of women sufficiently experienced in infant feeding and hygiene. Facilities must be provided for educating such women, and it devolves upon physicians to give this instruction.

Another reason for special education in infant hygiene is the increased interest in and knowledge of infancy on the part of the laity. The numerous booklets, the prize baby contests and infant welfare work and exhibitions have increased greatly the general body of knowledge of infant hygiene, especially among our young women.

If the physician is to hold his own proper place in the estimation of the community he must speak with authoritative knowledge on this subject—he must know more than the grandmother or the old nurse, more than the little "guides to mothers" or the patent food circulars, and must be able to give special advice for the individual case or problem.

What are the most important topics for consideration with regard to infant hygiene? An answer to this question may perhaps best be reached by first enumerating the problems to be attacked. We have, first, an enormous mortality before the normal time of birth, due to miscarriages, prematernity and still births. An investigation made in Philadelphia showed that in 1911 there were 39,975 babies born, and of these 2,131, or about 5 per cent, were still born. There were also 559 premature births in which the baby died, and there were during the same year 10,666 miscarriages. I questioned these statistics, but found on inquiry that they had been made up by Drs. Hirst, Norris and Borchard, of Philadelphia. They estimate the miscarriages and still births

as being almost one in every four pregnancies. This means that one out of every five of these pregnancies resulted in a miscarriage or still birth. Just think of the blasting of hopes, the discouragement of womanly effort these figures imply! Something must be done to prevent this enormous loss of life before its portals are fully entered.

Secondly, we have a very large mortality during the first few days and weeks of life. The health officer of Washington has stated that in 1911, out of 957 deaths in the first year of life, 151 occurred on the first day, 130 between the first and seventh days, and 114 between the seventh and thirty-first days; that is, 395, or about 40 per cent of the deaths of the first year occurred during the first month and about one-sixth on the first day. These figures were not exceptional, for in 1910, out of 1,070 deaths, 150 occurred on the first day, and in 1909, out of 1,042 deaths, 140 occurred on the first day. So we can set down one-sixth of the mortality of the first year as occurring on the first day, and almost one-third of the first year mortality as occurring during the first week. This first week's mortality is not due to the milk or the manner of feeding, but to earlier acting causes, such as hereditary weakness or disease, malformations, difficult or mismanaged childbirth and septic infection.

Thirdly, we have a large mortality during the remainder of the first year. This is due to difficulties with nutrition and to infection —particularly to gastro-intestinal and respiratory diseases. Along with this mortality there goes, of course, a morbidity whose prevention is possible to a large degree. A few statistics are of interest in this connection.

Prausnitz records that in 1900 in certain German cities, of 1,000 live born infants there were 225 deaths during the first year, and that of these more than one-third were due to gastro-intestinal disease. He records also the difference between the legitimate and illegitimate infants—the legitimate having a mortality during the first year of about 25 per cent, while the illegitimate had a death rate of 50 per cent. Foundlings showed a death rate during the first year of 66 per cent or over.

Of 10,000 infants nursed at the breast, there died during the first year of life, 580; of 10,000 artificially fed babies there died 4,588, that is to say, the breast-fed baby *has almost nine times as many chances for life as has the baby artificially fed.* This is the most important fact with reference to mortality and morbidity during the first year of life—that over 85 per cent of the mortality occurs in babies that are artificially fed. Manifestly the most important factor in baby-saving is to have the baby nursed by its own mother.

What measures must be taken to combat this waste of infant lives? To prevent the enormous premature mortality we must not only endeavor to bring about in the community the knowledge and the application of the findings of the new science of eugenics or racial hygiene; but there must be prenatal supervision by the physician with care of the mother by a nurse, and assistance from the State, if necessary, to prevent overwork and undernourishment. There should also be instruction of expectant mothers and of growing girls.

To reduce the high mortality of the first few days there must be better obstetrical care of the mother and baby at the time of delivery, and good nursing and feeding of the mother to promote nursing. Premature and feeble infants require especial care, together with breast milk, as a rule.

To reduce the mortality and morbidity of the first year the primary consideration is maternal nursing, though properly modified milk constantly adapted to the baby's needs may be used as a substitute when breast milk is not obtainable. Nursing by the mother is almost always possible if proper care and encouragement are given to the expectant mother. In an extensive experiment made by Dr. Schwartz in

New York, it was found that among 1,501 cases, 96 per cent of the mothers could be taught to nurse their babies for one month or less, 88 per cent nursed their babies for three months, and 77 per cent for six months. How much this means, for every drop of breast milk helps not only to nourish the baby but to develop and increase its digestive capacity for other milk or foods.

In order to promote nursing, preliminary care of the nipples is frequently necessary, and to prolong the nursing the mother's comfort should be considered, especially as regards her sleep at night. This can be done by making the nursing periods regular and at least three hours apart by day, with only one feeding at night; moreover, after three months an occasional bottle-feeding may be given, and in many cases the intervals can be lengthened to four hours. Every physician should appreciate the importance and understand the technique of maintaining breast-feeding as long as possible.

On the continent of Europe pediatrics has long been recognized as a specialty; not only have special journals for children's diseases been published for several decades, but the medical faculties have had special departments with full professors of pediatrics and special hospitals for teaching and research. Among the new university hospital buildings in Vienna the children's clinic occupies as prominent a position, and, with its contagious pavilions, covers more ground than the new medical clinic.

As in other English-speaking countries, the medical profession of the United States has been conservative about recognizing that pediatrics is a full grown specialty, but fortunately in the past twenty years a great change has taken place, and this subject is now being separated from general medicine and from obstetrics, in which some parts of the subject were formerly taught. Chairs of pediatrics with a full corps of assistants have been established in all the best medical schools and as rapidly as possible hospital bedside instruction is being given in infant feeding and hygiene as well as in the diagnosis and treatment of the diseases of childhood.

But tradition still holds strong with regard to the curriculum and it is difficult to obtain the requisite time for a proper presentation of the subject. The greatest and most promising field for the prophylactic medicine is that of infancy, so that it would seem that the medical schools might well revise the curriculum so as to devote definitely more time to the study of these problems of infant mortality and morbidity. I feel strongly that in many schools a part of the time assigned to anatomy could with advantage be devoted to pediatrics, and especially to the consideration of infant hygiene. By so doing a special interest would be added to the subject of general hygiene; for infant health is the yard stick of community hygiene. In matters of hygiene, what is best for the baby is best for the race.

113 *East Sixty-first Street, New York City.*

DISCUSSION.

Dr. James D. Love, Jacksonville, Fla.—Dr. La Fetra has left nothing unsaid that should have been mentioned in his paper. Personally, I feel under great obligations to him for appearing before us, and since my practice is limited to diseases of children I feel that my position has been fortified by the contentions that have been brought forward by him. The practice of pediatrics is a specialty in the South which is comparatively new. As far as I know, there are less than twenty-five men in the South who devote themselves exclusively to this branch of medicine. I hope this address will arouse interest in the practice of pediatrics, because more of you I think should devote more time and attention to this important branch of medicine. It is a difficult matter for pioneers in this work to secure the cooperation of the community that would be possible were more of us actively interested in this particular branch of medicine. Therefore, I hope and believe Dr. La Fetra's address will do much good in the way of stimulating an interest in this movement.

MEDICAL INSPECTION OF CHILDREN IN RURAL SCHOOLS.*

By William M. Jones, M.D.,
Greensboro, N. C.,
Health Officer of Guilford County.

The very great interest and necessity for medical inspection of school children is evidenced by the recent International Congress on School Hygiene held at Buffalo, N. Y. Medical inspection is already an established fact in all well regulated city schools, and has advanced to that point where it will ultimately work out its own salvation. The rural school, wherein are from 70 to 80 per cent of the school population of the South, has as yet no plan or system of inspection, the great majority of schools having no semblance of inspection, and nothing done by way of prevention. Those schools and communities that do have so-called inspection have no regular plan and no definite end.

There are many more or less good reasons why the rural school has been and is neglected. Some of them are ignorance, others prejudice; but the strongest, or so it appears, is the difficulty of reaching the rural school, and the financial expenditure necessary. However, medical inspection is more necessary and consequently more valuable to the rural school than to the city. In support of this assertion, let us consider some phases of the question that continually confront the rural schools which the city does not have. In erecting a building in the city, architect and building committee see to the arrangements for heat, light, and ventilation, and that everything is carried out according to specifications. The water from a general city supply, the same that the children have at home, is dispensed from sanitary fountains and all waste is disposed of by a municipal sewer system. All these requirements must be met and in some way answered by every rural school of from ten to twenty or more pupils. The rural school of only one room cannot, of course, have the advantage of an architect's ideas as to ventilation, light, heat, etc.

Then the community or neighborhood, not being accustomed to look after defects and not having the advantages and training derived from constant observation of large numbers of children, but seeing only semi-occasionally one or more children outside of their own little family, do not readily observe deviations from the normal, consequently more defects are overlooked by well-meaning parents in the country than in the city. Furthermore, the city boys or girls have many other natural advantages over their country cousins, and so far as is possible things should be equalized.

History demonstrates that a large per cent of our best men and women come from the country; not that the country is better than the city, but that the good material is equally divided. Man's life is influenced by heredity and environment. The heredity of a country boy is as good as that of the city boy. In some respects his advantages are superior and in some respects inferior; but, in the matter of schools, which is the one we have under consideration, the country boy is at a disadvantage. This is so much so that it amounts almost to class distinction. The life and health of the country boy is just as essential to the future of this country as the city boy. How are we going to solve the quetsion? Are we going to sit still and idly dream of some plan, or simply hope and pray that in some way, somehow, this question will be solved?

There is any amount of literature to be had, some good, some mediocre, but mostly poor. The reason for this is because so many who write these articles have deluded themselves with the idea that they are "thinkers," when, as a matter of fact, they are only dreamers and impractical dreamers, the kind that dream of some day finding a "spring of perpetual youth."

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They doubtless have formulated some idea in their imaginative brains of how to help the children and better the rural school surroundings, and this has all had its origin by seeing a rural school from the window of a rapidly moving Pullman. There is about as much of a practical nature in some of their articles as would be in a treatise on baseball when all the author knew about the game was obtained from watching a score board.

This is a day of action; action means motion, and motion the expenditure of energy. Do something! Get results! Do not theorize unless you can at once test your theory. This is a question of vast importance to the entire country, and more especially to the South, with its large per cent of rural population.

In the few minutes yet allotted us we shall endeavor to tell you how the medical inspection of the rural schools of Guilford County, North Carolina, is done. We have, of course, no theory to advance, but we will simply tell you how we are endeavoring to carry on some system of medical inspection in our schools.

First, that you may have some definite idea of the work, we will say that our county contains 672 square miles, with more than one hundred schools and two hundred white teachers. The objects that we have worked for and are working for are two—education and prevention. Education of the masses, particularly the children, and the prevention of disease, and the consequent conservation of life.

Education: By means of lectures and talks to the children, by pamphlets and bulletins, by press articles and notices, by illustrated lectures with lantern slides, dealing in an interesting and instructive way with such subjects as typhoid fever, malaria, the fly, and mosquito, smallpox, etc.; by clinics, such as hookworm demonstrations, and in every way possible we bring before the schools and community the gospel of good health.

Prevention: We have a large map of the county on which is located every school. The doctors of the county report all dangerous diseases to the County Board of Health, giving the name and address of parent and the school attended. As soon as the report is received, the teacher of that particular school is notified that the child has a dangerous disease, mentioning the disease, and that the other members of the family must be kept out of the school until further notice. A colored pin (different colors representing different diseases) is placed in the map at its proper location and is allowed to remain as long as there is danger of the disease being communicated. This gives at a glance whether this disease is sporadic and when an epidemic is brewing, and enables us to tell when to pursue drastic measures.

Then for the school building and grounds, *per se*. Upon visiting the school, and we endeavor to go to each one during the session, upon a card we record the condition of the grounds, and view the surroundings, noticing whether the grounds are well drained or not, and if not, so recording on the card. Next the privies, the number and condition. (Here, by way of parenthesis, we will say that so far as the so-called sanitary privy is concerned, it is impractical with us just yet, and, in fact, is more unsanitary than the common outhouse. All we strive for is prevention of infection from fecal matter, and privacy.) The water is next considered—its location, whether on the grounds or at a residence, and whether pump or bucket is used, and whether dispensed in a common or individual cup. The building is considered—the roof and chimney, heat and ventilation, and, when a structure of two stories, if a fire escape is handy or not.

Of all this a record is kept, and also on this card may be seen what recommendations were made the previous year, and whether these recommendations have been carried out.

We now enter the classroom, and refer to our card, whereon are recorded the names of those who were examined the previous year and found to be defective, and to whom individual cards were given naming their special defect and advising their parents or guardians

to carry them to their family physician for treatment. The physician is asked to sign this card and mail it to the County Board of Health. This is a long journey for a little card to travel, and many are lost en route, so on our permanent card whereon we have the record above mentioned *in re* the school, we also have the individual record of all defective children at the school. This is referred to and the children called up privately and asked if a card was not last year given them, and if so, did they carry out the instructions and go to their doctor, and if so, what was done? This is recorded on the card, and we then examine all new pupils and all who have not previously been examined. This examination includes the eyes, ears, nose, throat, teeth, skin, and special defects.

The eyes are to be examined first by the teacher, who keeps a record of all that are found defective, and when the examiner visits the school he examines only those that the teacher reports. This is to expedite the work.

The ears are examined by the teacher, who, if observant, soon notices any impairment without any set test. These are more fully examined by the examiner.

The nose and throat are examined by means of direct sunlight and a wooden tongue depressor. We examine every child in the primary and intermediate grades, and those in the high school who wish it. The teeth are examined at the same time with the throat.

The skin is examined for impetigo contagiosa, scabies, etc. Also special defects, such as hookworm and anaemia, are looked for. Those found defective are given a card and a record is made, containing the name, address and the particular defect.

By these means we hope to some extent to relieve the country boy and girl of a part of their handicap, in the attainment not only of an education, but a better and happier life.

OBSERVATIONS ON ANXIETY-NEUROSIS.*

By S. T. Rucker, M.D.,
Memphis, Tenn.

Anxiety is a psychic complex, or disturbed state of mind, characterized by fear and morbid apprehension, and attended with a sense of malaise and pre-cordial distress. Anxiety and worry are intimately associated. Perhaps worrry is best considered as a harassing and continuous state of anxiety. The primitive language of the infant is to fret and cry; in that way it makes known its wants and shows resentment when unduly disturbed. But the infant is free from anxiety and worry.

When a person becomes conscious that he is a living, thinking being, and that he must regulate his life and adjust himself to certain environments, he becomes subject to the state of mind called anxiety. Persons in good health should not worry, but they do when severely tried. The normal mind may react abnormally under sorrow and disappointment, and, for a time, be warped and twisted into inharmony by anxiety and worry. In most instances, however, a readjustment of the thought process soon takes place and equilibrium is regained.

When one becomes sick and nervous, psychic poise is more easily broken and normal balance more difficult to regain. Then one becomes more irritable and reactive, even to anxiously exaggerating trifling and harmless happenings. Harassing thoughts find lodgment in the mind and may revolve in a vicious circle, producing the symptom complex, which we call anxiety-neurosis.

As a general predisposing cause of anxiety-neurosis heredity plays a large part. Neuropathic parents transmit to their children a delicately poised and sensitive organization. They are emotional, mobile and unstable. They react abnormally to irritating and depressing

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influences and are potentialized towards nervous diseases. My observation has been that hereditary taint comes most frequently from the mother. Not infrequently a neuropathic mother will transmit a similar condition to all her children. In one family whom I had under observation and treatment, the father was tubercular all of his married life and finally died of the disease, leaving three children. Ten years after his death the wife had a severe attack of melancholia, but recovered and has since been well. Two of the children had "nervous break-downs," and the other one is psychically abnormal.

In another one of my families the mother suffered from hysteria ten years, was treated and recovered. She had two children, one was treated for neurasthenia and the other one for psychasthenia. The father of these children is a normal, healthy man.

It seems unfortunate and pathetic, from the human viewpoint, that the "iniquity of parents" should be visited upon their innocent children; such, however, is true. The law of heredity was known more than 3,000 years ago and abundant evidence has been furnished, from time to time, to convince observers that children do suffer from parental sin. In the light of our present knowledge of heredity, we have a strong argument in favor of studying and promoting the science of eugenics.

Another predisposing cause of anxiety-neurosis is early education in the home. Indulgent parents often fail to teach their children self-denial and self-control. A child grows up to girlhood accustomed to every whim being gratified and an abundant sympathy being lavished on every woe, however trifling. She reaches womanhood with a mental organization unfitted to withstand the cares of everyday life. She weakens under the strain of trying ordeals and develops a nervous trouble.

Among the exciting causes of anxiety-neurosis may be mentioned love affairs, unhappy marriages, sexual excesses, domestic worries and nervous strain due to business and professional reverses. Going under "high pressure" and playing a too "strenuous game" bring about physiologic bankruptcy and premature senility. According to Freud and his followers, anxiety-neurosis is due to a series of sexual injuries, and other influences from the sexual life. I have found this true only in some of my cases; in others I have been unable to find any influence due to the sexual life of the patients. I am rather of the opinion that mental conflicts, wrong convictions and misdirected thoughts, in persons of untrained minds, are more fruitful causes than sexual trauma.

In the clinical picture of anxiety-neurosis there are many symptoms, among which may be mentioned disturbance of respiration, or nervous dyspnea, attacks of tremor and chattering, attacks of diarrhoea, attacks of so-called congestion, muscular spasm, vomiting, disturbance of cardiac action, such as arrhythmia, tachycardia and pseudo angina-pectoris. Also a general irritability which is manifested in abnormal reaction to stimuli, of internal or external origin, as auditory hyperesthesia and the anxious anticipation of impending danger.

The patient is prone to attach undue importance to insignificant symptoms, as a pain in some part of the body means a grave disease. Or he may have a feeling that he is to suffer an apopletic stroke and that his heart ceases to beat, etc. Such patients become pale, weak and lose their equilibrium and must lie down.

The symptom complex of anxiety-neurosis is often associated with neurasthenia, hysteria, psychasthenia and melancholia, and forms a clinical picture around which the classic symptoms of these diseases are grouped. There are also many cases that are not clearly defined and, according to our present classification, must be separated from these diseases. This lends some support to the contention of Freud that anxiety-neurosis is a distinct entity and should be separated from neurasthenia. In two of my recent cases no association could be made with any other disease. The manifest

symptoms would not warrant a diagnosis beyond an anxiety-neurosis.

In studying human nature and the intricate workings of the mind I am sometimes persuaded that the "psychic side" is the most important factor in a person's life. I believe that the body is propelled in the direction of one's convictions and beliefs, and that organic function is increased, or inhibited, by certain states of mind. As mentioned above, I believe that misdirected thoughts and wrong convictions are largely responsible for the various nervous diseases. If this be true, as my observation and experience lead me to believe, psychotherapy offers most, as a theraueptic procedure, in treating anxiety-neurosis.

By the psycho-analytic method of Freud we are enabled to unravel psychic tangles and demonstrate submerged complexes and longings. By the process of suggestion and re-education wrong beliefs and habits of thought can be changed or repressed, and healthy psychic complexes be organized and substituted for unhealthy ones. Mental conflicts can be terminated and peace and calm restored to the tempest-tossed soul. Of course all this cannot be done at one "sitting," but it must be accomplished through a series of tactful and well-directed "seances." If there is any physical disability complicating the neurosis, it must be given additional treatment by appropriate diet, baths, massage, drugs, etc.

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THE COMMONEST NATURAL CAUSES OF SUDDEN DEATH.*

By David I. Macht, M.D.,
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In a monograph on Coroners, published elsewhere (1), I have enumerated in detail the kinds of cases which require medico-legal investigation. They were conveniently grouped into five classes:

1. Violent deaths.
2. Sudden deaths.
3. Suspicious or unnatural deaths.
4. Deaths where there has been no attending physician.
5. Deaths in prison.

Under the second heading—that of "sudden deaths"—fall a large number of cases, with which not only the coroner or medico-legal officer, but also the practitioner, has often to deal. In this class, I may say, we do not include deaths from accidents, from poisons, or other violent causes, but by "sudden deaths" we understand cases where persons died suddenly, or unexpectedly, after a very brief or no spell of sickness, from natural causes.

What are some of the chief causes of such sudden forms of death? It is obvious that we can learn them only in three ways: Firstly, from the past history of the deceased; secondly from the few symptoms and surrounding circumstances attending the exitus itself, and lastly, most important of all, from post-mortem examination of the body of the victim. It must be confessed, however, that very often the past or present, or both histories of the case are lacking, on the one hand, and on the other hand, the post-mortem examination, at least in the gross form in which it is ordinarily performed in these cases, not infrequently leaves us in the dark and unable to point out the essential relation between the change of structure in the tissues and the alteration in its function which brought about the cessation of life. Furthermore, if we bear in mind that in some cases a post-mortem examination is impossible or not permissible, we see that it is often but a matter of conjecture to decide what constitutes a fatal lesion or which of several lesions is the essential cause of death. In the face of these difficulties it is well to make statistical studies and analyze the observations of pathologists the world over, to learn

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what are the commonest visceral changes leading to or associated with sudden death.

The old division of forms of death by Bichat was into three classes: (1) Death beginning at the brain or *coma;* (2) death beginning at the heart or *syncope;* (3) death beginning at the lungs or *asphyxia.* Following this classification, a British coroner, W. W. Westcott, analyzed 1,000 of his cases and found that out of the 1,000 cases, 303, or about a third, were sudden deaths. Of the 303, the number of males was 185, that of females 118. Of the 303 sudden deaths, he ascribed 210 as due to syncope, 64 as due to coma, and 29 as due to asphyxia. In 88 cases out of the 303, or 29 per cent, alcohol was an etiological factor (3).

However convenient Bichat's classification of forms of death may be, it is certainly not very scientific in the light of modern researches in physiology and pathology, the discovery of new internal secretions, and the growing importance of hitherto neglected glands and other structures.

For schematic treatment we must divide the forms of death into at least four classes:

(1) Deaths due primarily to failure of the cardio-vascular system.

(2) Deaths due primarily to failure of the respiratory apparatus.

(3) Deaths due to failure of the vital brain centers.

(4) Deaths due to obscure and general causes not yet well understood.

Deaths due to a failure of the cardio-vascular apparatus constitute, by far the largest —probably over two-thirds—number of cases of sudden death. Here we may find the lesion in the heart itself, or in the blood vessels, or in both.

Of the lesions of the *heart* itself one of the commonest to bring on sudden death is a degeneration of the heart muscle, or myocarditis. This may be an interstitial change or interstitial myocarditis, or a fatty degeneration and infiltration or fatty myocarditis.

Stenosis of the coronary arteries, which is often found in cases of *angina pectoris,* does not usually itself lead to sudden death, but may produce degenerative changes in the heart muscle and in that way often causes sudden heart failure. A *tuberculous* myocarditis may be the cause of sudden death in various stages of phthisis.

Valvular disease of the heart usually induces a well-known train of symptoms and cannot therefore be regarded as a common cause of sudden death. A sudden and unexpected failure of the heart, however, may occur, especially in aortic disease, without any previous warning. In persons with known valvular diseases, a sudden acute dilatation due to exertion, emotion, etc., often terminates life very quickly. Cardiac thrombi or emboli by becoming detached and lodged in the orifices of the heart prove rapidly fatal. Other causes of sudden death due to changes in the heart itself are rupture of the heart wall and rupture of a valve, or of a chorda tendinea. An adherent pericardium may also be the cause of sudden death.

In addition to the organic changes just named, sudden deaths with symptoms of cardiac failure occur in which no satisfactory structural changes in the heart can be demonstrated and which are often spoken of as a functional disturbance of the heart's action. The best example of this is so-called *"shock."* Whether death from shock is due primarily to cardiac failure is very doubtful. It is more probably due to a paralysis of the vaso-motor and other nerve centers.

Of the changes in the blood vessels leading to sudden death, their rupture with the consequent bleeding, external or internal, is the commonest. External hemorrhages from ruptured arteries are so easily recognized that they need no further consideration. Not only arteries, however, but also veins may thus lead to sudden fatal hemorrhage. Profuse hemorrhage from ruptured varices about the female genitalia are not uncommon, and how even a very small calcified vein may lead to a fatal

hemorrhage, I have had the opportunity to describe elsewhere in the case of a small branch of the vena saphena parva (3).

Bleeding from a ruptured blood vessel may, however, take place internally, into the cavities or hollow viscera of the body, and thus lead to a very unexpected fatal termination. The commonest of these are ruptured aneurysms, rupture of extra-uterine fetal sacs, and concealed intestinal hemorrhages. Sudden fatal hemorrhages also occur in cirrhosis of the liver, acute hemorrhagic pancreatitis, gastric and duodenal ulcers, rupture of the spleen, etc.

Sclerotic changes in the blood vessels may lead to sudden death indirectly through thrombosis, embolism and aneurysm. In case of the veins, inflammatory changes with thrombosis and embolism are not uncommonly fatal, and, furthermore, *air embolism* and *fat emoblism* are gaining increased recognition as causes of sudden death.

Sudden death due primarily to failure of the respiratory apparatus may occur in obstructions of the larynx by foreign bodies, in sudden oedema of the glottis. It may be the cause of death in pulmonary tuberculosis, either through lack of vital lung tissue through sudden hemorrhage, or through formation of a pneumo-or pyothorax. It may be the immediate cause of death in the extensive consolidations of pneumonia. It may be due to an extensive and rapid pleural effusion, and in infants it not uncommonly comes after capillary bronchitis.

Oedema of the lungs is one of the commonest causes of sudden death and is generally due to a chronic nephritis.

Of sudden deaths supervening with signs pointing primarily to the brain, we usually think apoplexy is the commonest. Yet, though profuse cerebral hemorrhage, especially at the base of the brain, does lead to sudden death, the majority of apoplexy cases do not run such a rapid course. A man dropping suddenly dead is very much more likely to show myocardial change rather than a cerebral hemorrhage. A cerebral *embolism*, however, is more likely to produce a sudden exitus. Other causes of sudden death primarily from failure of the brain centers, are acute meningitis, acute alcoholism, chronic alcoholism, epileptic fits and uremic or diabetic coma. How far we are from knowing the exact mechanism of sudden death is well illustrated by cases of epilepsy, or by uremic or diabetic coma.

Whether death in epilepsy is due primarily to a paralysis of some vital centers in the brain, or to an asphyxia, or to a fatal syncope is an open question. Again, whether uraemia causes a fatal toxaemia of the brain, or primarily acts on the vaso-motor apparatus is still a mooted question.

We are forced, therefore, to assign a considerable number of sudden deaths to a class of obscure or general causes, of which we as yet know very little.

Here we must class malaria, diabetic coma and other autointoxications, such as that following intestinal obstruction. Again here it is best to place the very rapid and sudden deaths in certain infectious diseases, such as, for instance, pneumonia, Asiatic cholera, yellow fever, etc. Here belong the sudden deaths following exposure to excessive cold or heat. And lastly here we must place obscure cases of death associated with an enlarged and persistent thymus, and that constitutional anomaly spoken of as *constitutio lymphatica.*

It is hoped that the above short sketch may prove of use to coroners, insurance men and others interested in the subject.

3218 *Auchenteroly Terrace.*

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SOME RECENT SURGERY OF CRANIAL NERVES FOR THE RELIEF OF HEADACHES AND OTHER NEUROSES.*

By H. H. Martin, M.D.,
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We all meet with certain cases or groups of cases in our practice who have been kicked from pillar to post in the medical world until, like the famous dog in Private John Allen's story, they "come in and go out sideways;" and well they may, for as a rule the majority of us are usually more intent on getting rid of them than we are on trying to solve their problems. We condemn them indiscriminately to that unfortunate class known as neurasthenics, and often unjustly; we refer them to some one else and openly admit our incompetence, and are usually much relieved when we can pass them on.

As a result the majority of them, after making the rounds of all available reputable physicians, and after undergoing all of the new stunts, eventually fall into the hands of the quack, who usually fills their systems with dope and empties their pockets of whatever they might contain.

Now, I am quite sure that in 90 per cent of these cases a real pathologic lesion of some sort could be demonstrated if properly sought after.

Among these unfortunates, that very large group who complain of headaches, inability to use the eyes, dizziness, pain in the neck, the back, the ears, eyes, arms and shoulders and of facial neuralgia, naturally are referred to the ophthalmologist and otolaryngologist. Fortunately a majority of these cases are attributable to eye strain and are relieved by properly fitted lenses.

But unfortunately many of them are not relieved by correcting refractive errors, and since they have already passed through the hands of competent neurologists, internists, and, in appropriate cases, gynecologists as well, the question arises, what remains to be done?

Of course in those cases which are palpably due to active and demonstrable pathologic lesions in the various nasal accessory sinuses the answer is easy, but the class of cases to which I wish particularly to refer in this paper has no demonstrable lesion, at least has none in the present state of our knowledge. These cases differ in many ways from each other, and none of them can be rightly called typical; but there is a syndrome, or clinical picture fairly common to all of them.

Sluder describes this as a "symptom-complex, partly neuralgic (painful) and partly motor, sensory, and gustatory. The neuralgic picture is pain in the root of nose and in and about the eye, in the upper jaw and teeth (sometimes lower jaw and teeth) extending backward under the zygoma to the ear, frequently making earache and pain in the mastoid; but often severest at a point 5 cm. back of the mastoid; extending thence to the occiput, neck, shoulder-blade, shoulder, breast, and, when severe, to the arm, forearm, hand and fingers, with sometimes a sense of sore throat on that side. Rarer additions to this picture are itching of the skin of the upper extremity, taste disturbances (parageusia), a sense of stiffness and muscle weakness in the upper extremity and fortification scotomata. Mild cases are described as a sense of tension in the face and stiffness or 'rheumatism' in the shoulders. It may appear as constant pain with exacerbations, or it may stop and reappear with stabbing sharpness as a tic.

"The motor phenomena are changes in the appearance of the soft palate. Its arch is higher on the affected side, and the dimple which forms in the raphe just above the uvula in the act of gagging is deflected to the well side. The uvula is inclined obliquely to the well side. The sensory phenomena are, slight blunting of the tactile condition of the

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membrane of the nose of the affected side. The gustatory phenomena are confined usually to a slight blunting of the sense of taste on that side. Parageusia is rare."

Farther on Sluder says, "I have never seen all of these manifestations in any one case."

Neither has any one else, but those who closely observe these cases will see all of these manifestations at one time or another. I am quite sure that I have, and, in addition to the symptoms enumerated by Sluder, there is another one which I have come to regard as pathognomonic of a lesion in one or more of the nasal accessory sinuses, and that is, insufficiency of the internal rectus of an hyperopic eye, where syphilis can be excluded. This condition has been present and easily demonstrable in every case observed in my own practice and was demonstrable in every case shown me during my visit to Sluder.

Some years ago I conceived the idea that the insufficiency of the internal rectus was the principal cause of the most prominent symptoms in these cases and attempted in many cases to relieve them on that hypothesis, sometimes by the use of prisms and later by advancement of the weakened muscle and always succeeded in relieving the patient to some extent, but the relief was never complete nor permanent.

I do not know who first conceived the idea that these very troublesome cases were the result of sphenopalatine ganglion neuralgia and could be temporarily relieved by cocanizing the anterior wall of the pterygomaxillary fossa, and permanently cured by injecting the ganglion with alcohol and carbolic acid; but the most prominent workers in this field are Sluder of St. Louis; Otto May, of London; W. Krause, of Leipsic, and Holms, of Boston.

To Sluder undoubtedly belongs the credit for reducing this theory to a practical working basis and I recommend that all of you who are sufficiently interested obtain Sluder's reprints on this subject. (Foot notes.)

Sluder has done, in addition to his experimental work on the cadaver, 311 injections of the spheno palatine ganglion in 214 cases, with uniformly good results, and if his technic is closely followed the operation is not a difficult one.

Sluder's case reports are clear, concise and convincing, and if any of you will visit him, as I did this summer, you will see case after case such as those described in this paper whose frowns have been changed to smiles.

My own experience with this operation is at present limited to one case, which I shall briefly describe in closing. The patient was a woman of 44 who looked 60, her headaches dated from a blow with the fist of her loving husband, which had flattened her nose like a corncake. The house surgeon at a local hospital had straightened her nose up as best he could without splints, and in the ordinary course of events she recovered from her injury and left the hospital. I saw her first February 8, 1912. She had then been suffering more or less continuously for four years. I first examined her eyes, finding hyperopic astigmatism in both eyes with manifest insufficiency of the left internus.

Examination of the nose revealed a crumpled-up septum with much hyperplasia and deformity of the turbinates on both sides. I first corrected her astigmatism and presbyopia with little relief. I then did an advancement of the left internus with fine cosmetic result but no relief from her headaches. I then did a submucous resection, obliterating several pressure points, but her headaches, etc., continued. I then removed both middle turbinates and explored the antrum, frontal, ethmoid and sphenoid on both sides, finding all of these cavaties apparently normal; but when I had finished with her she was still having headaches. After visiting Sluder I injected her left spheno-palatine gangalion on June 30.

She reported back once a week until October 4 without a return of headaches or other distressing symptoms. I have not heard from her since that date.

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DISCUSSION.

J. W. Jervey, Greenville, S. C.—Here is another very excellent paper it will not do to let go by default. The fact is, though, that in this case Dr. Martin has passed us up a subject concerning which few here among us know anything.

I have read Dr. Sluder's papers. It seems to me he has worked his conclusions out from an empirical standpoint. It seems to be in the right direction. Dr. Sluder has shown a slight tendency to make his claims rather all embracing, and they appear to us to be at least a little beyond the confines of reason so far as our present knowledge is concerned. I refer particularly to his veiled intimation that perhaps conditions in the sphenopalatine ganglion are directly causative of many glaucomatous conditions in the eye, and I am sorry that Dr. Martin did not bring out that point. I was going to suggest that if the other paper had been read, on glaucoma, they should be discussed together.

I think Dr. Martin is to be congratulated on the success he has had in this case. I must confess, after reading Dr. Sluder's articles, that although I am more or less familiar with the anatomy of the nares and the adjacent parts, that I would dislike very much, without Dr. Sluder's personal experience, or without large experience from practice on a cadaver, to explore in the region Dr. Sluder describes and inject any sort of solution. Dr. Martin has profited by his work, and I think he is to be congratulated. It seems to me perhaps in the near future a great many of us will go out and see Dr. Sluder, or meet him at our different meetings, and get further information on this very interesting subject.

Homer Dupuy, New Orleans.—After the brilliant results which follow the injection of osmic acid into the nerve trunks of the supra-orbital, infra-orbital, inferior dental, and the posterior palatine, with a return of the tic douloureux one year or more after the injections, I have become skeptical with regard to the permanent results in this field of work. Sluder's work is to be commended, but we are still on the threshold of this very important subject, and we must withhold out enthusiasm until more extended experiments have been carried out.

J. Ivimey Dowling, N. Y.—I would like to cite two cases I have previously reported several years ago:

First, a woman some time before consulting me had allowed the lid of an icebox to fall, striking her forehead. From that time on she complained of supra-orbital neuralgia affecting the same side, and which had continued for about a year. The other instance was the case of a girl who suffered from spasmodic supra-orbital neuralgia. After treating her for some time I noticed that when she closed the lid there was a little protrusion of the upper lid in the region of the supra-orbital foramen.

In the first case I resected the nerve, because it was impinged by a fracture of the foramen. Cure followed the operation. In the second case I dissected a growth from below the supra-orbital foramen thereby relieving pressure upon the nerve. Since the resection there have been no symptoms.

J. B. Greene, Asheville, N. C.—I hope Dr. Martin will give us the technique of this injection. Dr. Holmes has reported one case, among his numerous cases, of hemorrhage which resulted very seriously. The patient was desperately ill. We should remember there is a slight danger, and we should be pretty sure of our diagnosis before advising operation.

H. H. Martin, Savannah, Georgia (closing).—I purposely refrained from mentioning some very interesting points in Sluder's work because he promised me he would be here himself. I have here a telegram saying he couldn't come. I expected him to elaborate this subject for me.

I think Dr. Jervey has a wrong impression. I do not think Sluder ever claimed or intimated that glaucoma was caused by an affection of the sphenopalatine ganglion. What he claimed and demonstrated was that cocainizing the anterior wall of the pterygo maxillary fossa would so anesthetize all tissues or organs supplied by Meckel's ganglion that the pain of gluacoma and other conditions would be instantly relieved. His method of cocainizing the ganglion is an extremely simple one, and more effective in his hands than in mine. He makes use of a saturated solution of cocaine, using a very small applicator with cotton wound on the end, not larger than a bean; this he passes along the lower border of the middle turbinate to the juncture between the posterior tip of the middle turbinate and the lateral wall. Then he tips the proximal end of the cotton carrier downward a little bit and presses it until it slightly wedges. He leaves it in contact for fifteen minutes. I have seen him remove middle turbinates, ethmoid cells, and also use the cautery in this simple way, and he tells me that septal operations can be done with this simple method of local anesthesia.

As to relieving the pain of glaucoma; during my first visit to Sluder, he had no glaucoma cases to show me. Fortunately, on my second visit a case was sent in the second day after I got there.

This woman gave the following history: She was suffering with a cold in her eye four months before and her doctor treated her for inflamed eye, using atropine. She suffered intensely. He said he could operate on her himself but didn't have certain instruments, so would send her to Dr. Greene, St. Louis. Dr. Greene referred her to Dr. Sluder. Her eye was as hard as that chair, as hard as that board. She was totally blind. She had not had relief from pain without an opiate for four months. Dr. Sluder did absolutely nothing but this simple method I have described of anesthetizing Meckel's ganglion. He applied the cocaine for fifteen minutes and kept her in the office four hours. She had no pain that afternoon and slept all that night without an opiate. I saw her in the afternoon of the next day and still she had no pain, although the tension had not perceptibly decreased. Sluder does not claim that Meckel's ganglion is an etiologic factor in glaucoma, but if you can sufficiently anesthetize the ganglion pain from glaucoma and from other causes will be relieved.

Now his theory, which has been characterized as more or less fantastic, is based on the fact that he could relieve many painful syndromes by applying cocaine to Meckel's ganglion.

Sluder has demonstrated also that the application of cocaine to the anterior wall of the pterygomaxillary fossa would so anesthetize the area supplied by the ganglion, particularly the turbinate bones and the septum, that any of the usual nasal operations could be done. I did not see him operate on the septum.

Dr. Dupuy asked how long the relief lasts. Sluder began this work in 1904. His first paper is dated 1908. He showed me a large number of cases during my two visits, some two years, three years, four years and five years free from pain. A great many had second injections, some only one. The immediate results of the injections are nearly always quite painful, lasting from a half hour to a half day. All the symptoms the patient has had before are greatly exaggerated when you inject his solution, which is 95 per cent alcohol and 5 per cent carbolic. I saw one girl, nineteen, who had to have morphine after four hours because of the pain. The next day she was free from pain.

The technique of the operation: In the first place I intended to bring my needle. It is made by Victor Mueller. The needle is long enough to puncture the sphenoid if necessary. After asesthetizing the anterior wall of the pterygomaxillary fossa he passes this long needle under the lower border of the middle turbinate, until the point arrives at the posterior tip of the middle turbinate, where it is attached to the lateral wall; he then turns it, pointing a little upward and outward; then he puts his left arm around the patient's neck, grasping the cross arm of the needle with the right hand and with a strong push it goes in. In some cases you might possibly get high enough to enter the sphenoid. If you do not point your needle properly you might shove it through the posterior tip of the middle turbinate and wound some of the vascular structure in the post nasal space.

A member: How far do you insert the needle?

H. H. Martin: Possibly three millimeters, not more, for the greatest diameter of the fossa is not more than three m.m. The first needles had stop shoulders, he says, now the shoulders are not necessary. In one case he first put the needle in, then let me manipulate the needle. This was a very good patient, he seemed to enjoy being worked on. He allowed me to practice on the other side. If you get an opportunity to do this on a cadaver it would be very well to do so. If any of you get an opportunity to spend two or three days with Sluder your time will be very well employed. I thank you very much. (Applause.)

EVOLUTION OF THE TREATMENT OF ECTOPIC PREGNANCY.*

By Stuart McGuire, M.D.
Richmond, Va.

The subject of ectopic pregnancy seems to have exercised a peculiar fascination for the medical mind. Since its recognition in the eleventh century men in all countries have given it much study. The etiology, pathology and symptomatology were soon fairly worked out. As to the treatment, the work of each generation is built upon that of the preceding, and it is hard for history to be just. But it is not too much to say that we are met today on the soil where the modern surgical treatment of ectopic gestation was made possible. The shaft which stands in Danville, Ky., to the memory of Ephriam McDowell bears the inscription, "The Father of Ovariotomy." And so he was. But as Abraham was the father, not of Isaac alone, but of a race, even so was this great Kentuckian the father of gynecology.

In studying the history of the subject it is well to recall at the outset that rupture of the tube usually occurs between the eighth and twelfth weeks. If this danger period be passed, the problems of treatment are quite distinct from those in the early stages. In the late cases nature sometimes attempts a crude surgery of her own, and spontaneously delivers the fetus by rupture into the rectum, through the abdominal wall, or into the

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bladder. As far back as the fifteenth century we find the surgeons of that day operating to facilitate delivery by these erratic routes. Primrose, in 1594, was the first to undertake section of the abdomen for this purpose. But he, too, had a natural suggestion hardly to be overlooked; for his patient, three years before, had suffered from the same condition, and the sac had ruptured through the abdominal wall. The first American surgeon to perform this operation was John Bard, of New York, in 1759. The second was William Baynham, of Virginia, who, in 1791, operated successfully upon the wife of a planter; and in 1799 did another upon a negro servant. His work earned for him title to a high place on the roll of those country practitioners whose sturdy self-reliance has so often done honor, not only to themselves, but to their profession.

In 1842 William Campbell, of Edinburgh, published a work on the subject, presenting an exhaustive review of the literature up to his time. It did not, however, contribute materially to the evolution of the treatment in the early stages. For forty years yet the profession was to wander in a barren wilderness of half-hearted surgical measures. The following review of these attempts exhibits at once their desperation and their futility.

I. Destruction of the Ovum Through the System of the Mother.

Von Ritgen, in 1840, advised starvation and purgation. Cazeaux, in 1861, advocated copious and repeated bleeding. Keller, in 1872, urged the administration of iodide of potash and mercury. Janvrin, in 1874, gave ergotin hypodermically. Barnes, in 1874, suggested large doses of strychnia, and later advocated syphilization.

II. Puncture of Fetal Cyst.

James Y. Simpson, in 1864, punctured the fetal cyst through the vagina, and evacuated the liquor amnii. The patient died after two days. Hicks, in 1865, punctured the cyst and attempted to destroy the fetus by direct violence. The patient died from internal hemorrhage on the fifth day. Greenhalgh, in 1867, punctured the cyst through the vagina. The patient did well for three weeks, then had a chill, abdominal pain and a bloody vaginal discharge. Finally, she passed clots and membranes and recovered. Tanner, in 1867, reported a similar operation. His patient was desperately ill for three weeks, and then passed the decomposing fetus through the rectum. Martin reported puncturing the cyst through the skin of the abdomen. The patient died. Thomas, in 1875, reported having punctured the cyst in two cases. Both died, one from hemorrhage and the other from septicemia.

III. Removal of the Embryo by Section of the Vaginal Vault with the Galvanic Cautery.

T. Gailliard Thomas, of New York, in 1875, advocated and practiced this method. He opened the sac, removed a three-months' fetus, but, in attempting to get out the placenta, had bleeding and was forced to abandon the operation and to inject subsulphate of iron to stop the hemorrhage. The woman recovered after a stormy convalescence.

IV. Galvanism and Electricity.

Bachetti, in 1857, reported that he had destroyed a fetus by inserting needles into the cyst, and passing through them an electromagnetic current. Cazeaux, in 1861, suggested using electric shocks. Hicks, in 1866, placed one pole in the vagina, the other on the abdomen, and passed a galvanic current. The fetus was not killed. Barnes, in 1874, used miniature lightning shocks by means of a Leyden jar, one pole introduced into the rectum and the other into the vagina.

V. Injection of Narcotic Substances into the Cyst.

Joulin, in 1863, suggested the hypodermic injection into the cyst, through the vagina, of morphia or some other narcotic agent to kill the fetus. Friedriech, in 1864, claimed to have cured a case by this method; but from the history he gives, it is doubtful if the patient really had ectopic pregnancy.

VI. Compression of the Cyst.

Malin proposed to destroy the fetus through severe and prolonged compression of the abdomen by means of sand bags.

During all this time the need was not for a Solon, but a McDowell. The obvious was not without its advocates. The abdomen was being opened for other purposes; ligatures for the control of hemorrhage were in common use. But the very magnitude of the catastrophe seemed to cause the profession to view from afar the rational method of treatment. In 1849 Harbert hinted at the possible value of the "Caesarean operation." Again, in 1866, Stephen Rogers, of New York, ventured to renew the suggestion. But not until the seventies did opinion begin to take real shape. Brown in 1870, Routh in 1871, Playfair, Meadows and Darby, of South Carolina, 1872, all wrote advocating what was then termed "gastrotomy." Spencer Wells and other leading abdominal surgeons of that day, however, refused to carry out the suggestions; and Perry, in 1876, was led to lament: "But no person has yet performed gastrotomy for the relief of this accident." The uncertainty of diagnosis, and the fear of not being able to arrest the hemorrhage after the abdomen was opened, stayed the hand of that generation.

In 1876 John S. Parry, of Philadelphia, collected and analyzed 500 cases of ectopic pregnancy. Of these 336 died and 163 recovered —a mortality of 67.20 per cent. The recoveries were due, not to primary operation, but to rupture of the sac externally. The percentage of recoveries (32.8 per cent) is larger than would be the case in a similar series today without operation, because in Parry's time many of the early fatal cases were unrecognized, and most of the late abdominal cases were recorded. Parry was not a surgeon, but his studies led him to a clear conviction of the treatment to be followed in the early cases, both before and after rupture. Being himself convinced, he voiced an appeal so clear and strong that the profession, in the person of Lawson Tait, was inspired to a death grapple with the death-dealing emergency. But let Parry speak for himself:

"From the middle of the eleventh century, when Alubcasis described the first known case of extra-uterine pregnancy, men have doubtless watched the life ebb rapidly from the pale victim of this accident as the torrent of blood is poured into the abdominal cavity, but have never raised a hand to help her. Surely this is an anomaly, and it has no parallel in the whole history of human injuries. The fact seems incredible, for if one life is saved by active interference it may be triumphantly pointed to as the first and only instance of the kind on record. In the whole domain of surgery—for we cannot look to other than surgical measures under the circumstances—there is now left no field like this. In this accident, if in any, there is certain death. How often do we see persons recover from injuries which their surgeons tell them will be mortal if they do not submit to a grave and terrible operation? . . . But in rupture of an extra-uterine fetal sac, in the early stages of pregnancy, a whole lifetime—a whole century—is not enough to enable one person to make two errors in regard to the prognosis of this accident. . . .

"The only remedy that can be proposed to rescue a woman under these unfortunate circumstances is gastrotomy—to open the abdomen, tie the bleeding vessel, or to remove the sac entire. . . .

"The question is not, Will the patient die after the operation? It is, Will she live if abandoned to nature? This was answered in the sobs and sorrows of stricken households long ago. . . .

"This operation, therefore, appears to be feasible, at least, no one has demonstrated its impracticability, and in these days when Durham removes the kidney, Pean and Koeberle the spleen and Billroth the larynx successfully, this procedure ought to be tried."

In Lawson Tait's book on Diseases of Women and Abdominal Surgery, published in 1889, we find recorded the response to Parry's appeal. He tells the story of a case to which he was called by a Mr. Hallwright, who had already made the diagnosis of ruptured ectopic gestation. Tait says:

"This gentleman made the bold suggestion that I should open the abdomen and remove the ruptured tube. The suggestion staggered me, and I am ashamed to say that I did not receive it favorably. I saw the patient again, in consultation

with Mr. Hallwright and Dr. James Johnson, and again I declined to act upon Mr. Hallwright's request, and a further hemorrhage killed the patient. A post-mortem examination revealed the perfect accuracy of the diagnosis."

Emboldened, or, to use his own expression, shamed by this incident, on January 17, 1883, Tait opened the abdominal cavity for ruptured tubal pregnancy. The first operation was unsuccessful. He refers to this case as a bitter disappointment, attributing his failure to overcaution and time-consuming work. But, within the next six years, he had reported 39 cases, with only two deaths. Truly, through disappointment and failure, did he achieve a triumph.

It is interesting to note the different positions taken by Parry and Tait on the question of diagnosis. Parry stated as the greatest impediment to the adoption of the treatment he urged, the uncertainty of diagnosis. Tait said: "The diagnosis of tubal pregnancy at the time of rupture may be made with certainty seven times out of eight, and may be guessed at in the eighth instance." He is equally positive in his skepticism of the diagnosis before rupture. "Much discussion," he says, "has taken place of late years as to the possibility of diagnosing tubal pregnancy before the period of rupture, and many strangely dogmatic assertions have been made to the effect that such cases have been diagnosed and effectually treated. I am bound to say that I am exceedingly skeptical concerning the correctness of these statements." On the other hand, Parry, while recognizing the difficulties, believed "that it may be discovered at a much earlier date than is generally supposed," and that "a more extended clinical experience would probably show that the existence of misplaced gestation can be detected quite as easily, if not more easily, than normal pregnancy in its early stages." This prophecy of Parry's was not slow of fulfillment. In the early eighties Joseph Price, a native of Rockingham County, Virginia, and a pupil of Tait's, turned his attention to the subject. His masterful presentation of the symptomatology and course of the disease put the diagnosis within the power of the general practitioner.

With Price the history rests. Problems still face us, but the condition was mastered when Parry, Tait and Price had finished their work.

So much for the evolution of the modern surgical treatment of ectopic pregnancy, because of its historical interest. Now for a brief discussion of some of the still unsettled questions, because of their practical importance.

I. The Question of Drainage.

This should be decided by the special indications in the individual case, but more often is governed by the practice or prejudice of the operator. All surgeons drain some cases, but some surgeons drain all cases. The ability of the healthy peritoneum to take care of a large quantity of free blood is being more generally recognized, and injurious irrigation and useless drainage of the abdominal cavity are being rarely employed. In a case of ruptured tubal pregnancy, unless there is evidence of pelvic infection, the wound may be safely closed without drainage.

II. The Question of Saving the Ovary on the Affected Side.

This is not a question of principle, but of practice. We all know that a healthy ovary should not be removed; but many of us in the stress of critical operations, clamp and remove the ovary with the tube as the quickest and easiest way of dealing with the situation. In many cases there will be no reason to regret the method practiced, but in other cases there will be cause for regret and condemnation. If disease develops in the remaining ovary, requiring a second operation for its removal, the woman is made sterile, suffers from premature menopause, and frequently becomes the victim of hopeless neurasthenia.

III. The Question of Immediate Operation.

All surgeons agree that an operation should be done on a case of unruptured tubal pregnancy as soon as the diagnosis is made. In-

stances are so numerous of rupture occurring while the patient was waiting to go to the hospital, or, while in the hospital, waiting for the surgeon to come, that it is now the universal practice to operate on these cases with the greatest promptness. There is, however, a serious difference of opinion among the best surgeons as to when to operate on a case *after* rupture occurs. One school advises an immediate operation to arrest the bleeding, claiming that 5 per cent of all cases will die from primary hemorrhage, and if the patient escapes this danger, a fatal secondary hemorrhage may occur at any time. The other school advises waiting until hemorrhage ceases, reaction takes place, and the operation can be done under more favorable conditions. They admit that 5 per cent of the patients will die, but claim that these cases would not be saved unless the surgeon was present at the time of the accident and operated with a jackknife and shoe string; and maintain that the greatest good to the greatest number is achieved by waiting for an opportune time to do the operation. This question has been so often fought out on the floor of medical meetings, such as this, that most of my audience have formed a definite opinion, which is not likely to be changed. I wish to go on record, however, as favoring an immediate operation, not only because it is in accord with general surgical principles, but also because, in personal experience, I have seen the practice save apparently moribund patients.

IV. The Question of Removing or Ligating the Opposite Tube to Prevent Repetition.

The frequency with which a woman, after being operated on for pregnancy in one tube develops the same condition later in the other tube, makes it necessary to consider the advisability of removing both tubes at the first operation to avoid a repetition, which the pathologic tendency of the patient, as well as clinical experience, makes probable.

The removal of both tubes would not add appreciably to the danger of the operation, would not interfere with the function of menstruation, and would not increase the chance of distressing physical or nervous sequelæ. It would simply render the woman sterile. But is this desirable? To secure a positive immunity, have we a right to sacrifice a possible maternity? This involves two questions. First, what proportion of women operated on for tubal pregnancy have a recurrence in the remaining tube; and what per cent of women after such operation become normally pregnant and give birth to a living child? Second, what is the danger of an operation, and what is the value of a baby?

The first question can easily be answered by compiling statistics. The second is almost impossible of solution, as there is no basis for comparison.

In 1911, Smith, of Grand Rapids, tabulated 2,998 operations for tubal pregnancy, in which recurrence followed in 113 cases, or 3.8 per cent. He believed this percentage was too low, as he thought it was impossible to follow up such cases accurately over a sufficient period of time to get final results. His investigation as to normal pregnancy following the operation was even more unsatisfactory. In thirty of his own cases, three had borne children since the operation, one being pregnant in utero at the time of the operation. He concluded that normal pregnancy followed less frequently than might be expected.

Essen-Moller, of Lund, after reviewing fifty-six cases of ectopic pregnancy of his own, and the reports of others, concluded that intra-uterine pregnancy may occur after recovery from tubal gestation without operation in the proportion of 46 to 100; and further, that there seemed to be no difference in this respect between the patients operated on and those not operated on, except that drainage after ectopic gestation tends to make the occurrence of intra-uterine pregnancy afterward less frequent.

I have recently reviewed the case histories of the last fifty cases of tubal pregnancy

operated on in my private hospital. Six of these patients have had recurrence in the remaining tube. This I know, for I did the second operation myself. There may be other cases in the series who went elsewhere for treatment and who would add to this 12 per cent of repetition.

I have tried to ascertain how many of the patients operated on for tubal pregnancy subsequently became normally pregnant and gave birth to a child. The result was very unsatisfactory. One patient never had a husband; another became a widow shortly after leaving the hospital; some could not be located; others would not answer, etc. I know, certainly, that seven have borne one, or more, children; and I believe the number would be doubled if I could get the true figures.

Smith, the author previously referred to, believes that before an operation for tubal pregnancy the patient should have the situation explained to her, and she should decide whether or not the opposite tube should be removed. But a woman just before an operation for ruptured ectopic pregnancy is in no condition to understand or settle a complicated proposition. If she decides either for or against the removal of both tubes she will in after life frequently regret the responsibility of the decision, fearing, on the one hand, a repetition of former accident, or indulging, on the other in morbid longings for a child whose advent she has made impossible. The operator should settle the question for himself without taking the woman into his confidence, remembering all the time that a surgeon's and a patient's attitude to an operation is often very different, and that their estimate of the desirability of a baby is often very far apart.

Personally, I am opposed to the removal of the opposite tube, unless it is obviously hopelessly diseased. If, by leaving it, I have subjected some patients to a second operation that might have been avoided, I have equally certainly made possible the birth of some babies that otherwise would not have come into existence. As a surgeon I fear operations little, and as a bachelor, I value babies highly

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DISCUSSION.

Dr. R. E. Fort, Nashville, Tenn.—The historical review of the doctor's paper was excellent, but there is an aspect of extra-uterine pregnancy that should challenge the attention of this and all other medical societies until settled.

I refer to the difference of the two schools in the treatment of primary rupture. One urges immediate intervention, the other advises procrastination, claiming that the patient will not bleed to death, but can be reacted and operated upon at a less hazardous time. The statement of these two men becomes the more important because of the eminence of some of the surgeons who take this latter position. Personally I regard procrastination as little less than criminal. When a patient is seen early after rupture it matters not how profound the shock, as I have seen three of these cases bleed to death, and in each case this was proven by autopsy.

Of course, it is impossible for us to know in what part of the tube rupture has taken place. Joseph Price has very wisely said that "the outer half of the tube was the surgeon's end, and the inner half the coroner's end." I do believe that few ruptures of the outer half of the tube will actually bleed to death if let alone. I am certain that a majority of ruptures of the uterine end and interstitial will bleed to death if let alone. Personally, if a case is seen late, with exsanguination and extreme shock, I will open the abdomen, put on a clamp, react the patient, and finish the operation at a later time.

I do not believe that tubal pregnancy in the opposite tube occurs with sufficient frequency to give us the moral right to sacrifice the healthy tube upon the suspicion that at some future time a pathological condition may occur, especially as the condition is easily remedied at the time of its occurrence.

Dr. Joseph Graham—Mr. President, this is a very interesting subject, this subject of ectopic gestation, and I am very glad Dr. McGuire brought it before us. Ectopic gestation is a very much more frequent condition than the general practitioner realizes. I have had a limited experience in surgery, yet I have operated upon a large number of ectopics. Recently we had three cases sent in in two days. I have operated a good many times when I thought I was going to find it, and did not do it, and sometimes I have found it when I was looking for other things.

In regard to diagnosis: I think a blood examination is of great value in diagnosing suspected ruptured extra-uterine.

Dr. McGuire spoke in regard to the time of operation whether to tide these cases over or to operate immediately. I have lost one case of extra-uterine pregnancy in which case I did not operate. In that case I had a gown and gloves on ready for immediate operation when patient was admitted to hospital. She was in extreme shock. We hoped she would rally. She lived six or seven hours and then died. We performed an autopsy and found a ruptured tube.

Dr. Price used to say, "If the tube ruptured at the uterine end the case belonged to the undertaker; at the fimbriated end, to the surgeon; if in the middle of the tube, it was debatable, might go to either surgeon or undertaker."

In regard to the operation, I think there is one little point in technique that promotes safety in the handling of the cases. I make the usual median incision down to the symphysis, then make a small transverse incision, so as to get wide retraction. I make no attempt to find upon which side the extra-uterine is, but after making full retraction, I place rubber-covered clamps on both ends of each broad ligament, then we have no danger of hemorrhage.

A great many men doing this work try to work rapidly. They try to do it too hastily. Control hemorrhage and you have absolute control of the situation and there is no need to make haste.

I never remove an ovary unless it itself is diseased and necessitates removal.

Dr. McGuire spoke of the question of drainage. My rule in regard to this has been never to drain an extra uterine. I have never seen an active, bad peritonitis follow closure without drainage. In the majority of these patients the blood has been extravasated for several days or weeks. Some of these cases after operation develop an infected hematocele and require a simple vaginal section and drainage.

Dr. Geo. H. Bunch, Columbia, S. C.—In regard to the remarks of Dr. McGuire, I concur most heartily, but there is one important phase of the subject that has not been mentioned. In not every case of rupture does the foetus die and in some cases the surgeon does not get the case until some time has elapsed after rupture. I have assisted in one case in which the pregnancy had continued ten months, the placenta had become attached to the peritoneum and to the under surface of the liver. The child in this case of abdominal pregnancy weighed eleven pounds and was well formed in every particular, although dead when delivered

Just a word of caution in the management of such a case will not be amiss. Do not attempt to remove the placenta at the operation, for if you do the patient will likely bleed to death on the table. Leave the peritoneum open and in the course of several weeks the placenta will gradually separate without hemorrhage and the patient's life will be saved

Dr. W. B. Thorning, Houston, Tex.—I wish to add one word to Dr. McGuire's statistics. I have operated upon 43 cases of ectopic pregnancy. Of the 32 with whom I succeeded in communicating, six women had borne children, two of them had two each, and out of the 32 cases there was no recurrence of the condition.

Dr. H. P. Linsz, Wheeling, W. Va.—Dr. McGuire's paper is so exhaustive and well gotten up that I feel we are to be congratulated on having had the pleasure of the doctor presenting it to us at this meeting.

I have nothing to add, but wish to report a case of ruptured tubal pregnancy which came under my observation.

The distended abdomen on being opened, was found to be full of blood. The blood was mopped out and the bleeding apparently stopped. The ruptured tube was removed and everything necessary done, and the abdominal incision closed. After we had taken the patient off the table we noticed blood oozing through the incision between the stitches. We reopened and found that the abdominal cavity was full of blood from no reason that we could ascertain except her husband told us his wife was a bleeder. Three or four times we endeavored to control the bleeding which seemed to come from everywhere with little or no success. As a last resort we placed a quantity of dried sulphate of iron in the pelvic cavity, packed tightly with two or three large sterile towels and placed the patient in her room, not expecting her to recover. Next morning we found the patient resting well and in fairly good condition. We removed the towels, closed the abdominal wound, and the patient made an uninterrupted recovery.

Dr. Danna—Gentlemen, Dr. McGuire has covered the ground so thoroughly that I have nothing to add, except that I recall one case of double tubal pregnancy. Also I remember two cases in which it was not necessary to remove the ovary on that side.

THE OSTEOGENETIC FUNCTION OF PERIOSTEUM AND BONE TRANSPLANTS—RESEARCH.

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and
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When we undertook the experiments to be reported the situation as we found it may be best summarized in the words of the leading men of opposing views:

Dr. Murphy, of Chicago, before the American Surgical Association at Montreal in 1912, stated the following:

"The periosteum fully detached from bone and (1) transplanted into a fatty or muscle tissue bed in the same individual, if he be young, may produce a lasting bone deposit. (2) Periosteal strips elevated at one end from

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bone and attached at the other, if turned out into the muscle or fat, reproduce regularly bone on their under surface for a greater portion of their length. (3) Bone with its periosteum transplanted into muscle, etc., in the same individual, and free from bony contact, practically always dies and is absorbed. (4) Bone transplanted without its periosteum into the muscle of cellular tissue always dies and is ultimately absorbed. (5) The transplanted fragment, no matter how large or how small, is always ultimately absorbed. The role it plays is to give mechanical support to the capillaries with their living osteogenetic cells, etc. Annals of Surgery, Vol. 56."

Macewen, of Glasgow, in his work, "The Growth of Bone," states:

"While not underestimating the periosteum as a limiting and protecting membrane of great use in physiological and pathological conditions, there are no data to indicate that it can of itself secrete or reproduce bone. It has no osteogenetic function.

"The periosteum is a fibrous membrane, composed of two layers, the inner of which contains many elastic fibres and blood vessels in a minute state of subdivision. Besides these two recognized layers, however, there is a quantity of loose areolar tissue existing between the inner of the two layers of the periosteum and the bone. It is sufficiently loose to permit of easy penetration by the osteoblasts emanating from the underlying tissue, etc. The periosteum acts as a limiting membrane to the osteoblasts issuing from the interior of the bone." "In cases where bone is said to have been produced from transplanted periosteum, bone plaques must have been raised from the bone in process of removal of the periosteum and have been transferred along with it." "It has been shown that the bone from the diaphysis can be transplanted in bulk and that it grows without the intervention of periosteum."

Schepelmann, quoted by Haas in 1913, finds that periosteum when transplanted into omentum, liver, etc., regenerated persistent new bone.

Albee, F., 1913, was unable to show any regeneration of bone from periosteum.

Thus it will be seen that at the time we undertook this work there was no unanimity of opinion in regard to the various phases of the question of regeneration of bone.

Our experimental work has thus far dealt with the following phases of the subject:

1. Has the free bone transplant an inherent osteogenetic function?

2. Has the periosteum an inherent osteogenetic function?

3. Is periosteum necessary for bone growth?

4. Is the periosteum a limiting membrane?

More than thirty separate experiments have been made on dogs, young and old, cats and rabbits. Some of the work has to be repeated and more work is to be done before our final results will be ready for publication.

Experiments 1, 2, 17, 24, 27, and 29 have to do with the first problem, the osteogenetic function of the free bone transplant.

In the above series we were able to demonstrate the presence of bone transplants, actively proliferating in some instances at the end of periods varying from 5 weeks to 4 months.

The specimens which I have for your inspection show bone transplants in the spleen, omentum, rectus muscle, thyroid gland and the anterior chamber of the eye. The resume of the histological examination of these specimens, given in the words of my colleague, Professor Gustav Mann, is as follows:

"The results of histological investigation show that after transplantation of a piece of rib into the rectus muscle, spleen, and after wrapping up of a fragment of bone in the omentum, there is no indication of absorption after 5 weeks." "The piece in the omentum is least active, that in the spleen shows distinct signs of bone formation. The Howship's lacunae on the surface are well marked; lying in the lacunae are osteoblasts. The best

evidence of active bone proliferation of bone was seen in the rectus muscle.

"The appearances seen here are identical with those seen in the jawbone of a newly born kitten. The bony trabeculae are lined with bone forming cells arranged so close together as to almost form the palisade. From the projecting points of the trabeculae streamers of osteoblasts pass out into the surrounding tissues. It is always easy to tell whether any particular surface or trabecula is actively engaged in bone formation because of the deep staining of the cells and cell nuclei, for they will remain after the other cells have become decolorized."

As a result of the foregoing experimental data I believe we are justified in stating at this time that small free bone transplants are not always absorbed, that they may and do grow independent of bony connections. In other words, the bone transplants as such may survive and reproduce bone.

Experiments 5, 25, 26, 20, 23, were undertaken with the idea of establishing for ourselves whether or not the periosteum would reproduce bone, either in situ or transplanted free of its own vascular connections.

The periosteum was elevated, as suggested by Macewen, and a muscle bundle interposed between the periosteum and the underlying bone, after which the periosteum was sutured below (5, 25). Free periosteal transplants were placed as bands around the carotid artery, into muscle, and into the anterior chamber of the eye. In no instance did we have a growth of bone from the periosteal transplants.

We feel justified in concluding at least that periosteum does not regularly reproduce bone on its under surface, and further that we have never been able to note any active osteogenetic function on the part of the periosteum.

In experiments 4, 8, 12, 20, 21 and 30 we removed the periosteum from the shaft entirely circumferentially, fractured the bone from which the periosteum had been removed, removed a segment of bone from a bone which had been previously stripped of periosteum in that segment, and in every instance new bone was proliferated, to a greater degree in some instances than when the periosteum was intact under similar conditions. In this respect the 3rd and 4th problems have merged into one, as we found small nodular elevations on the rib from which the periosteum had been removed from a segment of its circumference. (The lung collapsed, animal resuscitated and lived). In experiment 20, in which we had elevated the periosteum and placed it around muscle, we found nodular elevations on the surface of the bone from which the periosteum had been removed.

CONCLUSIONS.

As a result of our experimental work we are led to conclude in this preliminary report:

Periosteum does not always reproduce bone; in fact, we have never been able to show the existence of an osteogenetic function in the periosteum.

2. Periosteum is not absolutely necessary for bone growth or repair.

3. Small free bone transplants, free of periosteum and individual blood supply, may grow.

4. The periosteum may be considered as a limiting membrane.

Experiment I. April 15, 1913.

Adult dog. Ether anesthesia.

Trephine button removed from parietal bone. Bisected trephine button. Scraped free of periosteum. Transplanted fragments into traumatized rectus muscle and into omentum. Killed by Dr. Mann because of the development of meningeal symptoms.

Repeated experiment April 29, black adult dog. Killed June 10.

Wounds healed first intention. Skin not adherent to rectus muscle. There is a hard mass in the belly of the rectus where the transplant has been inserted. Large square of muscle removed, having as its center the hard mass.

Omentum found—there was a hard mass in the omentum at the seat of the transplant.

The portion of the skull from which trephine had been removed was excised.

N. B.—Histological report showed bone formation in rectus and omentum; also reproduction

in bone from free edges of parietal bone. Periosteum not active.

Experiment II. April 19, 1913.

Sub-periosteal resection of rib.
Divided into three fragments.
Transplanted into rectus muscle.
Transplanted into spleen.
Transplanted into omentum.
Periosteum sutured over cleft in rib. Infection of wound.
Animal killed April 24. Repeated experiment April 26.
White, brown face, brown spot on back.
Rectus muscles contain two pieces of bone in muscle, another doubtful piece of bone.
Spleen contains bone fragment.
Omentum contains bone fragment.
Specimens show active bone present.

Experiment III. April 22, 1913.

Young white bitch, brown head, brown spot on tail.
Periosteal cuff removed from tibia.
Platinum loop or band put on shaft, which was free of periosteum.
Traumatized muscles of leg.
Periosteum transplanted into left rectus muscle.
X-ray picture taken June 6, 1913.
Dog found June 24, killed.
No bone outgrowth into the surrounding tissue. Ring of platinum was surrounded by connective tissue. No bone enclosing platinum.
September 24. Platinum loop removed from decalcified specimen by Dr. Mann.

Experiment IV. April 22, 1913.

Periosteal cuff of rib removed.
Collapse of lungs. Convulsions. Artificial respirations and heat applied.
Periosteum fixed to be used as specimens of normal periosteum.
Dog killed June 5. No adhesions of skin to muscle. Wide resection of chest wall. Trachea was occluded during inspiration. Several ribs removed. Preserved.
Macroscopically—Rib from which periosteum had been taken showed on under surface a thickening (ring-like).
No adhesions to lung.
Lung fully expanded.

Experiment IV. May 1, 1913.

Brown male dog.
Periosteum of radius was incised in long axis—raised from shaft. The elevated periosteum was passed around a muscle bundle, sutured above the periosteum, which was still attached to shaft.
Wound healed primary intention.
Killed June 5. Specimen preserved for examination.
No bone growth from periosteum.

Experiment VII. May 1, 1913.

White bitch, black left ear.
Periosteum of right tibia was incised longitudinally.
Tibia fractured. Periosteum sutured. Killed June 14.
Union—Large amount new bone thrown out, forming a cuff.
Preserved for decalcification in Mann's double salt solution.

Experiment VIII. May 1, 1913.

Same dog as Experiment VII.
Periosteal cuff removed from left tibia. Tibia fractured. Killed June 14.
Large amount of callus thrown out. Union perfect. Preserved specimen for decalcification.

Experiment XI. May 7, 1913.

White bitch, black ears.
Removed periosteum from left tibia, made cuff of the periosteum around a platinum wire and inserted in a defect in right tibia. (Inserted transversely.) Unsatisfactory.

Experiment XII. May 3, 1913.

Rabbit, gray. Male adult.
Periosteum was scraped from entire shaft, exclusive of epiphyses—left femur. At end of eight weeks to compare size of femora.
June 14. Femora removed. No difference.

Experiment XVII. May 10, 1913.

White female adult (dog).
Left front leg and right hind leg were used.
A part of the ulna stripped of periosteum was removed and transplanted into a similar defect made in the right tibia. Osteogenic or osteo-conduction of bone.
Right tibia. Wound healed primary. In a tendon over seat of transplant there are several small hard spicules.
No palpable defect in bone.
Left ulna removed. Some palpable spicules along where defect was made.

Experiment XVIII. May 10, 1913.

Male dog, white, black spots.
The medulla cavity of the left radius was opened with a burr. Marrow tunneled out for a short distance. Into this space a narrow piece of the shaft of the same bone was inserted surrounded by a piece of gauze.
Killed June 23. Small sinus in shaft of bone. Put up for histological examination.

Experiment XX. May 7, 1913.

Dog. White female, brown ears. Left front leg was operated. Periosteum from shaft of radius was elevated, placed around the tendon of one of the flexor muscles. Same as Experiment V.

Died June 2.

June 3. Operated. Segment of radius was removed. Freed of muscle and periosteum. There is elevation of bone, where periosteum had been removed at time of operation. Specimen of muscle and periosteum saved for histological examination.

Experiment XXI. May 15, 1913.

Brown male dog.

Right humerus was exposed. The shaft for an inch was freed of periosteum.

About half an inch of the shaft was resected. Wound closed. Leg was held in extension while plaster cast was applied. Right leg. Dog limps. Some motion at seat of resection large outgrowth. Right humerus much larger than left. Killed June 24. Some motion—large, hard outgrowths into surrounding tissues.

Experiment XXII. May 15, 1913.

Brown male dog. Same as Experiment XXI.

Left humerus was exposed. The periosteum incised, lifted from anterior part of shaft, with rongeurs, part of the circumference of the shaft was removed.

The fragment removed from the right humerus was transplanted into the medullary cavity.

Killed June 24. Primary union. No hard nodules in muscle. The defect in the bone seems to have been repaired—preserved.

Experiment XXIII. May 13, 1913.

Black bitch.

Removed periosteal cuff from radius.

The periosteal cuff thus removed was placed as a band around the left common carotid artery.

Killed May 24, 1913.

Wound healed primary. Carotid found. Band in place not hard. No obliteration of carotid. No outgrowths into surrounding tissue.

Radius removed—small nodules on surface.

Experiment XXIV. May 23, 1913.

Male dog (old).

Radius (dept.) exposed—fragment (linear) removed with chisel. This was implanted in left lobe of thyroid.

June 28. Wound healed primary union. Killed June 28. Black lobes thyroid removed. No enlargement.

Experiment XXI. June 18.

Gray and white male cat. Periosteum removed from right tibia—small fragments were chiseled off the tibia. Petriosteum was inserted into anterior chamber left eye. Into the right eye small fragments of bone were inserted in the anterior chamber.

Experiment XXVI. June 19.

Spotted gray female cat. Periosteum stripped from tibia. Right carotid exposed—periosteal cuff placed around common carotid.

September 4, 1913. Ether anesthesia carotid was exposed and seen to pulsate above band of periosteum. No occlusion of vessel. No bony outgrowth into surrounding tissue. See Halstead Annals of Surgery, August, 1913.

Experiment XXVII. June 19.

Black male cat.

Bone fragment from tibia of animal, Experiment XXVI. Transplanted anterior chamber right eye. September 4. Fragment increased in size.

Experiment XXVIII. June 28.

Gray kitten.

Radius exposed. Platinum loop was put around radius subperiosteally.

Killed August 7, 1913. Loop found in situ. No covering of bone over loop.

Experiment XXIX. July 1.

Black bitch (young).

Resected about one inch fibula (left) and transplanted into left erector spinal muscle.

Leg wound became infected (dog tore bandage off).

July 12, killed. Block of muscle containing transplant removed for examination. The end of the bone that was palpable had become rounded.

Experiment XXX. July 8.

White bitch. Brown spots on ears.

Left tibia exposed. Periosteum removed from shaft. To be preserved and compared with other tibia at end of eight weeks. The periosteum (several pieces) was transplanted into the left erector spinal muscle.

Killed September 4. Union primary. Muscle soft. No hard nodular masses. Preserved. Tibia removed, shows distinct nodular outgrowth on anterior aspect spine tibia.

Experiment XXXI. July 12.

Young animals, one month old. Black and white feet. Setter.

Removed periosteum and shaft of tibia. Guttered the tibia, leaving only small shell posteriorly.

Question. Periosteum in relation to regeneration of bone. Infection. Died.

Experiment XXXII.

All black. Leave periosteum. Died.

PULMONARY EMBOLISM AS A SURGICAL COMPLICATION.*

By Jno. H. Blackburn, M.D.,
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In my experience during the past fourteen years, including practically all branches of surgery, it has been my fortune, or rather misfortune, to see five cases of sudden death in surgical practice.

It is perplexing enough to the young interne to try to explain to the visiting surgeon why his case had died suddenly when there had been absolutely no warning. But it is a much harder problem, frequently mingled with feelings of embarrassment and chagrin, for the young surgeon, with a reputation to make and sustain, to try to give to the friends and family a satisfactory reason why the young mother should be taken and leave the infant daughter, or why the father should be suddenly called from a dependent family.

In this series of six cases there are inclued five cases of sudden death: One post-operative, one after a forceps delivery, and three after fracture of the femur. The sixth case, a puerperal complication, finally recovered. In none of these cases was a post-mortem permitted; however, the clinical evidence was unmistakable, the time of onset, the duration and the symptoms all indicating pulmonary embolism.

An embolus is defined as a foreign body or undissolved material floating in the blood-stream, which by becoming impacted in some part of the vascular system produces the condition known as embolism. As the embolus in each case of this series was due apparently to the detachment of a portion of a preceding thrombus, this discussion resolves itself into a consideration of the causes of thrombosis and the symptoms and diagnosis of pulmonary embolism.

Etiology.—Welch[1] in his classic on "Thrombosis and Embolism," gives as the causes of thrombosis: (a) slowing and other irregularities of the circulation; (b) lesions of the cardiac and vascular walls, as inflammation, atheroma, calcification, tumors, injury, etc.; (c) infective thrombophlebitis, as phlegmasia alba dolens of the puerperium, in typhoid fever, influenza, etc.; (d) chemical changes in the blood, increased fibrin-ferment, etc.; (e) increase of the blood-platelets.

Haward[2] classifies the causes of thrombosis as a disturbance of physiological relation between blood and vessels by: (a) changes in vessel walls from traumatism, inflammation, degeneration, etc.; (b) changes in the blood, from bacterial invasion, physical changes and chemical changes; (c) retardation or arrest of blood current. He also discusses the different theories advanced by investigators as to the relative value of the different cellular and chemical constituents of the blood.

Blumer,[3] in a theoretical consideration of the problems of thrombosis, first discusses coagulation of blood, and then emphasizes the importance of agglutination of the blood-platelets as a factor in the production of thrombosis. He gives a historical review of the work and workers on agglutination and shows the relation of bacteria and their toxins as well as other poisons, in the production of haemaglutinins. He also discusses the relation of the mechanical factors concerned, slowing of the current, traumatism of the vessel wall, etc. He then goes quite fully into the etiological relationship of certain diseases to thrombosis.

Wilson,[4] in a clinical consideration of fatal post-operative embolism, mentions (a) injury of the vessel walls; (b) slowing and stagnation of the blood current; (c) disintegration of the blood corpuscles from toxic substances, and (d) bacteremia, as the important factors in the production of post-operative thrombosis which is primarily responsible for the embolus. He also draws certain conclusions therefrom with a view to reducing the mortality from this cause.

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Clark,[5] in a clinical and experimental study of post-operative thrombosis, concludes that in a large proportion of cases the retraction of the abdominal walls and the traumatism of the deep epigastric veins is responsible for the development of this condition.

Albanus[6] gives as the causes of thrombosis: 1. Before operation; changes in the heart muscles, in its valves, in the blood itself, or in the vessel walls. A whirling in the blood stream, as where the superficial and deep epigastric veins enter the long saphenous and external iliac, and the cerebral veins empty into the longitudinal sinus, entering at a right or obtuse angle and thus favoring clotting. Long continued dorsal position before operation. Tumors producing pressure on the veins; enlarged spleen. 2. From operation: Cooling of abdominal viscera; injuries to vessel walls; adhesions; thrombi in cut ends of vessels; anesthetic. 3. From after-treatment: Bandage pressure; prolonged dorsal position; meteorism; increased intra-abdominal pressure; fecal masses in sigmoid pressing on left external iliac vein.

Aschoff,[7] whose work is both original and critical, goes very fully into all phases of the question of thrombosis, dealing largely with the experimental work. He concludes as follows:

"Let us take, then a final glance over the subject of static and toxic thrombosis. We see that neither endothelial damage, on which so much stress was previously laid, nor a direct coagulation of the blood, play any role. Only two real reasons for the thrombosis require to be considered and their merits weighed one against the other. I refer to the changes in the blood elements themselves, and to the slowing of the blood stream. Neither of these two factors can be excluded, as even in the experiments where thrombi of different sorts are produced by heightening the agglutinability of the blood-platelets by the disintegration of white or red corpuscles, these thrombi can occur only where normally a marked slowing of the blood stream is present, for example, in the capillaries of the lungs, liver and spleen. But even by very marked destruction of the blood elements it is impossible to produce thrombi by deposition in the larger veins when no slowing of the current occurs.

"An additional factor, therefore, needs to be considered, especially in cases in which the thrombi are localized in the large veins, and where the above-mentioned capillary regions of the lungs, liver and spleen generally implicated in toxic thrombosis remain free. In such a case the increased agglutinability of the blood-platelets cannot be the direct, exciting cause, but a definite and recognizable slowing of the blood-stream must first of all occur.

"So we see from all these experiments that the slowing of the blood-stream and the alteration of the blood elements themselves, especially alterations of the platelets, are the chief factors in the productions, not only of the static, but of toxic thrombosis, so far as we are concerned with thrombosis formation in the flowing blood-stream. In static and similar types of thrombi the slowing of the blood-stream is of prime importance, while for the toxic varieties the changes in the blood elements have the dominating influence."

Symptoms.—The symptoms of pulmonary embolism practically always develop suddenly, the history of thrombosis at times being present, but in many cases no evidence of a thrombosis. Frequently the onset is preceded by some change in position of the body or limb of the patient, however it may come on during the sleep, as in three of my cases. Death may be almost instantaneous, if one of the large branches of the pulmonary artery is blocked. In most instances death ensues within fifteen to twenty minutes. There is intense dyspnoea, great precordial pain, or substernal distress, cyanosis, weak, irregular, thready pulse. If smaller branches of the pulmonary artery are involved there may be a gradual subsidence of the symptoms with recovery of the patient after days, or the symptoms may gradually increase to a fatal end.

Diagnosis.—The diagnosis will, of course, depend somewhat upon the history of the case. In operative cases shock and pneumonia may be suspected, but the time of onset and the suddenness and intensity of the symptoms will differentiate an embolism of any magnitude. In the puerperal cases the diagnosis is easily made, as this is a relatively frequent compli-

cation during the puerperium. In fractures the diagnosis will be indicated in large measure by the time of onset of symptoms as suggested by Dennis[4]: "Shock may be said to be present *three hours* after the fracture, fat embolism *three days* after, and pulmonary embolism *three weeks* after."

Case I.

Mary S., negro, female, age 52. Nashville City Hospital, 1899-1900. Service of Dr. W. D. Haggard. Large uterine fibroids, with pain and hemorrhage. Under ether anesthesia Dr. Haggard did a complete hysterectomy. Recovery was uneventful. On the ninth day, in making my night rounds at 8 p. m., inquired as to her condition, when she told me that she was feeling fine. At 10 p. m. I was called hurriedly by the nurse, who informed me that ten minutes before my arrival on the ward the patient had suddenly aroused from an apparently sound and peaceful sleep with the statement that she could not get her breath, wanted more air. She soon sat up in the bed, gasping and crying out, saying that she was dying for breath. She was practically pulseless on my arrival, with intense dyspnoea and substernal pain, mind perfectly clear, but soon fell back on the bed, dying within twenty minutes of the onset of the symptoms.

Comments.—In this case the size of the fibroid tumor and its duration, with the pressure on the veins of the pelvis, suggest the probability of this being the site of the thrombus. Clark's[5] theory that the abdominal retractors cause an injury to the deep epigastric veins, and by extension the thrombus grows into the external iliac with the breaking loose of part of this clot could hardly have developed in such a short time, nine days. The depressed condition of the patient, due to the repeated hemorrhages, rendered her more liable to thrombosis, but there was nothing in the previous history or during her convalescence to suggest the presence of this condition.

Case II.

Mrs. J. W. C., white, female, age 23. Seen in consultation with Dr. T. W. Stone on June 29, 1905. Primapara, in labor for eighteen hours, pains inefficient, no progress for three to four hours. Low forceps delivery, under chloroform anesthesia, with slight perineal laceration, requiring three sutures. No evidence of any disorder whatever, when we were called hurriedly on the night of the thirteenth day and on arrival at the home found the patient dying. She had aroused from sleep complaining of shortness of breath and precordial pain, extreme dyspnoea, marked cyanosis, pulseless, and dying within about twenty minutes after first symptoms.

Comments.—In this case the traumatism may have resulted from the use of the forceps, but this does not explain the cases of sudden death in natural deliveries, as reported in many instances. Blumer says that "trauma, aside from injuries associated with infection, plays but a small part in the etiology of thrombosis." The lacerated perineum or other lacerated tissues about the vulva and vagina offered an entrance for infection, bacteria and their toxins. According to Playfair[6] any obstruction of the pulmonary artery occurring before the fourteenth day is due to thrombosis, and that due to embolism does not occur until after the nineteenth day.

Case III.

A. M. P., white male, age 52. Attended in consultation with Dr. T. W. Stone. First seen October 3, 1905. Fell from roof of house onto pile of rocks, causing a fracture-dislocation of the left elbow and fracture of the left femur at the junction of the middle and upper thirds. Under chloroform anesthesia the fracture-dislocation was reduced and the arm placed in right angle splints. The femur was put up in Buck's extension apparatus, with 16 pounds weight, with long splint external and sandbags internal to maintain position of foot. Constitutional disturbance was remarkably slight, there being no fever after the fifth day. On the eighteenth day the weight was reduced to eleven pounds, and on the twenty-fifth day to six pounds. On the night of the twenty-ninth day at 2 a. m. the patient aroused his wife, saying that he was dying; could not get his breath. Dyspnoea increased rapidly, cyanosis became marked, and he died gasping for breath within twenty minutes after onset of symptoms.

Comments.—It is possible that the traumatism to the veins of the arm may have been responsible for the thrombosis; however, it is very unusual to have a thrombosis in the upper extremity or in the superficial veins of the lower, although phlebitis is relatively frequent. The presumption is that the trau-

matism to the deep veins of the thigh, the profunda and circumflex, led to the formation of a thrombus, the embolus being secondary to this, and breaking off while the patient was asleep. The length of time after the injury and the character of symptoms present would exclude shock and fat embolism.

Case IV.

Mrs. M. S., white, female, age 69, weight 210 pounds. Seen in consultation with Dr. H. P. Cartwright. On July 18, 1907, she fell to the ground, producing a fracture of the neck of the left femur, the so-called extracapsular fracture. The patient and family doubted the existence of a fracture at first, and she tried to walk on it for two or three days. No anesthetic was used, and on account of her weight and age, the correct position of the limb was maintained by the use of sand bags, the patient being permitted to move the body about in the bed. On August 26, thirty-eight days after the injury, she was lying on the bed resting quietly, when she suddenly called to her daughter, saying, "I can't stand this, I can't get my breath." She quickly sat up in bed gasping for breath, dyspnoea extreme, tearing at clothing, and fell back in bed, dying within three or four minutes after first symptom. After death the position and mobility of the limb suggested that there had been very slight union.

Comments.—In this case there was no marked displacement of the fragments; in fact, rather an impaction of them. There was no evidence at any time of infection, nor of the existence of thrombus. The embolism appeared in this case later than usual. No indication of a hardening of the arteries to suggest a hemiplegia, which on account of her age must be considered.

Case V.

G. R. McC., white, male, age 70. Treated in consultation with Dr. J. L. Neel. First seen November 10, 1910, within thirty minutes after he had fallen from a wagon in attempting to alight from it. Sustained an oblique fracture of the right femur at the junction of the middle and upper thirds, with marked overlapping. Without anesthesia was put up in Buck's extension on single incline plane with long external splint and sand bags internal, to maintain position of limb. Eighteen pounds weight prevented overlapping of fragments. During the night of the fourth day he developed a frank lobar pneumonia in the lower lobe of the right lung. After a characteristic temperature and pulse, with typical physical signs, the crisis came on the eighth day of the disease, thirteen days after the injury. On the seventeenth day after the accident, four days after the crisis of the pneumonia, he suddenly complained of shortness of breath, substernal distress, dyspnoea, cyanosis; and died within 18 to 20 minutes after the onset of symptoms.

Comments.—In this case there was first the probable injury to the deep veins of the thigh, on account of the marked displacement of the fragments, followed by the possible infection secondary to the pneumonia; thus combining the traumatic and toxic factors. Blumer states that venous thrombosis is rare in lobar pneumonia, except, of course, the local thrombosis in the pulmonary veins; that it occurs as a rule in the lower extremities and on the left side, and that it is usually a sequel rather than a complication. Clinically, we can exclude pneumonia as being more than a contributing factor in this case.

Case VI.

Mrs. E. B., white, female, age 27. Seen in consultation with Dr. G. H. Freeman. She was attended in her second confinement by another physician, the delivery occurring at 12 o'clock noon, January 26, 1913, after being in labor six hours. At this time the patient had a general oedema of practically the entire body, completely water-logged, suffering most of the time with shortness of breath, sitting up in a chair night and day, but had not called a physician to attend her at any time during the pregnancy. On the night of January 28, fifty-six hours after the confinement, she became quite restless and much disturbed, and suddenly developed extreme dyspnoea, cyanosis, rapid feeble pulse, and profuse perspiration. Seen by Dr. Freeman at 2 a. m., January 29, when she had the extreme dyspnoea, marked cyanosis, rapid thready pulse, 140 to 150, subnormal temperature, and apeared to be in a dying condition. Hypodermics of morphia and strychnin were given and condition relieved slightly. Cough some during the day, the sputa showing the brick dust stain at 8 a. m. During the day she was somewhat more comfortable, but had the attacks of dyspnoea at intervals, and remained cyanosed all the time. Dr. Freeman was called again in the afternoon and found the condition extreme. I saw her first at 9 p. m. on the 29th. She was sitting up in bed, unable to lie

down, with extreme dyspnoea, quick superficial respirations, 50 to 60 per minute, and increased by any movement or effort to talk. The cyanosis was marked, the entire body showing it. There was a subnormal temperature, weak, thready, irregular pulse, 150 to 160 per minute, and profuse perspiration over the entire body. I was unable to make out any abnormal sound over the heart, but on physical examination of the chest found impaired resonance over the entire lower lobe of the right lung, with many fine moist rales over this area, heard loudest at end of inspiration. Hypodermics of morphia relieved the dyspnoea somewhat and slowed the respirations slightly, but the cyanosis became more intense and she appeared to be dying. With varying intensity these symptoms persisted, and another physician who saw her the following night, the 30th, expressed the opinion that she would live only an hour or two. The examination of the urine at this time showed it loaded with albumen and in very small quantity. Physical examinations at intervals indicated that the obstructed portion of the lung became solidified, pulmonary infarct. This extreme condition of the patient continued until the 31st, three days, when she began to show definite signs of improvement. The albumen persisted in the urine for eight weeks, but a recent examination shows normal in quantity and constituents. The convalescence of this patient was slow and tedious, and during the fifth week, while still in bed, she developed a phlegmasia alba dolens in the left leg.

Comments.—In this case the onset of the symptoms, which are characteristic of embolism, occurred in a very short time after delivery, and may be accounted for as an acute thrombosis as suggested by Haward.[10] "Sometimes, however, a thrombus may form in a large branch, giving rise to symptoms similar to embolism—severe and distressing dyspnoea, faintness, cyanosis, and great circulatory disturbance. These symptoms may subside, and recur at varying intervals with each addition to the clot, until at last the complete occlusion of the vessel brings about a fatal result." However, there was doubtless sufficient cause for the development of a thrombus to be found in the chemical changes in the blood.

Treatment.—After a detailed account of these cases it will be seen how absolutely futile would have been any treatment directed toward the relief of any one of the first five, all of them dying within from four to twenty minutes after onset of symptoms. Nor could there have been any specific prophylactic measures instituted, since there was no indication of the existence of a thrombus in any one of them. In the last case, which recovered after a very severe and protracted illness, the treatment was entirely symptomatic.

As to Trendelenburg's suggestion as to operative treatment, while theoretically correct, it is in practice an impracticable procedure. It consists in a resection of the second rib on the left, opening the pericardium, compression of the aorta and pulmonary artery by elastic bands, opening the pulmonary artery and removal of the clot, then suture of the pulmonary. Before the last meeting of the German Surgical Association, Schumacher," of Zurich, on the Operative Treatment of Pulmonary Embolism, "discussed the symptoms and diagnosis of large emboli of the lung and the indications and technic for Trendelenburg's operation. He based his conclusions on three operations for emboli conducted by the Trendelenburg method in the Zurich clinic, and a few carefully observed necropsies after death from pulmonary embolism. He distinguishes three forms of death from embolism of the lung: (1) The almost instantaneous death from shock; (2) death occurring rapidly from very large emboli which completely fill the trunk or the two principal branches of the pulmonary artery; (3) death following after many minutes or even hours from emboli with a protracted course. In cases with a rapid course, operation is more or less obligatory, as there is a chance of saving life. There may be also in these cases anatomic relations which are favorable to an operative extraction of the embolus. In cases with a prolonged course one is justified in resorting to operation if in spite of stimulation an aggravation of the condition cannot be prevented. In two cases of this sort he observed the appearance of a valvular second pulmonary sound which disappeared as the force of the heart became less.

Probably this disappearance of the clear tone constitutes a clinical sign indicating that operation should not be delayed."

To summarize briefly this series, we would mention the more important features as follows: There were five whites and one negro; two males and four females. The ages were 23, 27, 52, 52, 69 and 70 years. The post-operative case died in nine days; the forceps case in 13 days; the three fracture cases in 17, 29 and 38 days. In the puerperal case the onset was in three days, with an ultimate recovery. In three of the cases the onset of symptoms was during sleep; the other two were in bed and not making any physical effort at the time the symptoms developed. In no case would it have been possible to have gotten the patient out of bed any earlier in order to prevent the development of the thrombosis. In no case was there any evidence of a thrombosis or an infection. Anesthesia had been used in three cases, ether in the fibroid, and chloroform in the forceps case and one of the fractures. Previous conditions that may have had an influence in producing chemical changes in the blood were: The pregnancy in one case, the pregnancy and nephritis in another, the hemorrhage in the fibroid case, the complicating pneumonia in one of the fractures, and possibly the obesity in the other.

CONCLUSIONS.

Pulmonary embolism secondary to venous thrombosis is a relatively frequent complication in general surgical and puerperal cases, as well as after operations.

There is no specific cause in all cases, but as a rule it develops as the result of a combination of trauma and certain blood changes, either of a chemical nature or from bacterial invasion.

A vast amount of experimental work has been done to prove or disprove certain theories regarding thrombosis and embolism, but the solution of the problem of cause and prevention will depend upon the carefully kept and reported records of clinical cases, that the relationship of the many factors may be learned and the predisposing causes removed.

Even with the most careful preparation, operative procedures and after-treatment there will doubtless be a certain number of cases of thrombosis with the secondary development of embolism.

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DISCUSSION.

Dr. I. L. Van Zandt, Fort Worth, Texas.—I have been at work a long time, but have seen only one case of this kind. Some thirty years ago I was called to see a woman in confinement attended by a midwife. One child had been born and the arm of another was protruding from the vulva. I introduced my hand, brought down the feet, and delivered a dead child.

I then began to manipulate the womb, preparatory to delivering the placenta, when the woman began to gasp and within three minutes was dead. There was no hemorrhage.

Dr. H. B. Gessner, New Orleans, La.—I have no light to throw upon the pathology, but I had a clinical experience with pulmonary embolism three years ago.

My patient was a white man 35 years of age, a physician in excellent health. I did an operation for hernia upon him and I wish to call attention to the fact that the anesthetic was almost exclusively gas in his case. There was no particular reason for using gas except that he wanted it in order to avoid the post-operative vomiting, so the anesthetist gave him gas almost exclusively. At one time, in the course of the operation, there was some struggling, and we gave a small quantity of ether. The operation was done on Monday. On Tuesday of the following week he was up in a chair and down in the courtyard. That evening after he had gone back to bed he had a fainting

spell about 8 o'clock. They sent for me and he said that he had had a fainting spell but was feeling well again. He thought something he had eaten had caused indigestion. At that time the wound had healed and the discharge from it had been but a slight, serous one. That same evening about 10 o'clock he suddenly fell back while being given an enema and died almost instantaneously. Artificial respiration was employed at the time, but did no good.

We were fortunate in having a post-mortem—a very careful one—done by Dr. C. W. Duval, who found a clot in the pulmonary artery. He not only did that, but opened the wound and was able to trace a clot along the external iliac vein to the vena cava. The arteries were quite sclerotic, Although the patient was only 35, his arteries gaped quite widely and we thought the sclerosis explained his thrombosis and embolism.

Speaking of thrombosis, I had another case, which led to gangrene and not to embolism. I removed a chronic appendix for a patient between 20 and 30 years old on a Wednesday morning. On the following Wednesday morning I showed that same patient to the class as cured. By the way, one of my cases of thrombosis was operated on Monday and developed trouble on Tuesday of the following week—the ninth day. This other case was operated on on Wednesday and on Thursday of the following week—again the ninth day—developed symptoms. The following Wednesday morning, as I say, this man was shown as cured. The next day—the ninth day—he had a sudden collapse. The house surgeon who saw him prescribed stimulation. He died of a gangrene of the cecum and ascending colon, which I assume was due to thrombosis of the mesenteric vessels. The anesthetic in this case was ether.

Dr. J. W. Brandau, Clarksville, Tenn.—I just want to report a case, a lady about 72 years old, who had pulmonary embolus, three days after operation for varicose veins. The patient suddenly complained of great difficulty in breathing. When I reached her the cyanosis was very extreme and the pulse very feeble. I at once gave her a hypodermic of 1-30 grain of strychnine and in thirty minutes more strychnine and nitroglycerin. In a few minutes after giving the second injection she began to improve, the cyanosis continued for some hours, when she became normal and made a good recovery.

That goes to show that they don't all die. This case was undoubtedly a case of that kind, caused, most probably, by a blood clot from the large vein floating into the circulation.

Dr. J. S. Turberville, Century, Fla.—I wish to report a case of septic thrombophlebitis in a patient following abortion in which an embolic pneumonia developed. This occurred about the eighth day, as had been my observation in the past. This was, of course, fatal, but she lived eight or ten days after the pneumonia began.

Another case might be reported, because it resulted from a simple operation. It was the removal of a fibroid tumor from the front of the thigh, but it necessitated a great deal of dissection. We started out to do the operation under local anesthesia, but had finally to give ether. The patient reacted all right from the general anesthetic—she waked up and called for water—but in perhaps twenty minutes after the operation I was called to her bedside, and there was a dying patient. She was cyanotic—had a weak, thready pulse. We tried artificial respiration, but without effect.

This might have been a case of poisoning from cocaine. We used a rather large quantity. During a long operation like this there was, of course, a lot of bleeding, and presumably most of the cocaine had been eliminated in this way. However, she died under the conditions described.

Dr. Gessner.—How strong was the cocaine solution?

Dr. Turberville.—We used about ½ of 1 per cent.

A Member (name not understood by stenographer).—I remember several years ago a case of a similar character, in which no anesthetic was used—a case of urethral stricture—in which a urethratome was used in the relief of this rather severe stricture and, as well as I remember, it was five or six days afterwards there were quite a number of small abscesses formed in the lungs, and evidently from the gangrenous condition of the lungs—most offensive discharges and odors from the lungs. I mention it more to emphasize the fact that it is not necessary to have a general anesthetic to induce this condition. It was undoubtedly a case of septic thrombosis—the result of this operation. This case did not die. In consultation with two very prominent surgeons of Nashville they both gave up hope entirely of the patient's getting well, but by persistently using antiseptic sprays and stimulants the patient got well after several weeks, but there must have been at least a dozen or more of these outbreaks of this offensive, purulent expectoration as a result of these different abscesses that formed in the lungs which were undoubtedly the result of thrombosis.

Dr. Blackburn closes.—I might say that the most satisfactory explanation and the most comfort we can get out of these cases is, in my opinion, to be found in Aschoff's paper in the November 15 issue of the Archives of Internal Medicine, I presume just out this week from the A. M. A. office.

He claims the principal cause of thrombosis is, first, slowing or retardation of the blood current in conjunction, secondly, with the alteration in the blood platelets, either in their numbers or characteristics. He describes the modus operandi of the thrombus formation and shows that a large number of cases are going to occur in the practice of all of us, regardless of our method of treatment of fractures, or our operative or puerperal cases. A certain number of cases of thrombosis are going to occur, dependent upon this condition of the blood stream and the retardation of the flow normally at certain points, and the frequency of these certain factors that are mentioned. So that, really, we are all going to have these very deplorable conditions at times when we are not in any way responsible, nor could we in any way prevent their development. A little comfort in that, but that is about all.

LOCAL AND VENOUS ANESTHESIA.*

By Geo. F. Bicknell, A.B., M.D.,
Tampa, Fla.

No one subject in surgery has developed so fast in the last few years as that of local anesthesia, and it does seem that Americans who are the best anesthetists in the world, are a bit slow in taking up with it. Of all drugs used in local anesthesia novocain is the least toxic, least irritant, and has the advantage that its solutions may be boiled without deterioration. Novocain works best as a base, the anesthetic power being greater the weaker its combined acid. Gross[1] says novocain bicarbonate solution is five times stronger than HCL salt. Braun[24] denies that the action of novocain is increased to such extent; however, he does find that potassium sulphate helps. Braun uses ordinary novocain—HCL as it comes in tablets or bulk in ½, 1, or 2 per cent solutions, to which adrenalin is added, usually in the strength of 1-100,000.

The toxicity of novocain depends upon concentration and method of administration. Concentrations to be used are ½ to 2 per cent solutions, and one can safely use enough of the ½ per cent solution to anesthetize the operative field.

Limits given		Novocain
1 per cent solution Nast-Kolb[2]	50 c.c.	0.5
Axhausen	170-200 c.c.	1.7-2
½% solution Braun	100-250 c.c.	0.5-1.25
Bier clinic		.8

A ½ per cent solution is the weakest to be used, although Hoffman[23] and Kochman[3] state that by the addition of 2 per cent potassium sulphate the novocain can be reduced to 1-10 per cent, and that the potassium sulphate does no harm. (Braun[24].) *Toxic symptoms are rarely noted.* Occasionally we find mentioned faintness, vomiting shortly after injection, loss of accommodation, warmth of body, headache, and paresthesias.

Novocain is not so good on mucous membranes. Here Reimers[4] uses 10 to 20 per cent solution of alypin to each c.c., to which two or three drops of adrenalin are added, and has never had any toxic symptoms as formerly with cocaine.

Suprarenin, suprarenalin or adrenalin, whichever is used, is added to bring about anemia by producing vaso-constriction, thus prolonging the anesthesia and rendering the field almost bloodless during the operation. Suprarenin is a synthetic preparation similar to adrenalin chemically, and having the same physiologic action. Its strength is more uniform, and it has the advantage that it can be boiled without inactivating it. Suprarenalin and adrenalin are, of course, organic extracts, and are apt to be impaired by boiling. In the Bier clinic adrenalin solution 1-1000 is taken from fresh bottles and added to the previously boiled novocain solution. The concentration of the adrenalin desired is 1-100,000 or 1-200,000 from the aid of which dilution a uniform intensity and duration of the anesthesia is obtained.

If the concentration be too weak the anesthesia is too short and the bleeding from the vessels is considerable, it is desirable that the smaller vessels should bleed when cut, so that they may be picked up and tied, otherwise post-operative hemorrhage may occur. If the concentration be too great we have no hemorrhage from the smaller vessels and the vaso-constriction may be so great as to cause gangrene of the tissues. Where intensive action is desired use 1 or 2 per cent solution of novocain, and in these stronger novocain solutions the adrenalin content is proportionately raised. Personally I have had better results with the 1 per cent solution, where nerve trunks had to be blocked.

Formulas for adrenalin with novocain:

(a) *Adrenalin dilution*	1-100,000
½% novocain	200 c.c.
Adrenalin 1-1000	2 c.c.

*Read by title in the Section on Surgery of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

(b) *Adrenalin dilution*.....1-100,000
1% novocain ..... 100 c.c.
Adrenalin 1-1000 ..... 1 c.c.
(c) *Adrenalin dilution*.....1-50,000
2% novocain ..... 50 c.c.
Adrenalin 1-1000 ..... 1 c.c.

Never use over 2 c.c. of adrenalin solution. The contra-indications to the use of adrenalin are in: Regions of end arteries, arterio-sclerotic extremities, flap wounds, flap plastics, fingers, and penis. In the last two locations an Esmarch bandage may be used for vaso-constriction. The anesthetic solutions should always be freshly prepared.

Preparation — Scopolamin-morphine, or morphine-atropin, given one-half to one hour before beginning to work, is a valuable adjunct, especially in nervous individuals. Hysterical, highly excitable people, and children under ten years are unsuited for local anesthesia.

INFILTRATION AND NERVE-BLOCKING ANESTHESIA.

With novocain we practically always do a nerve-blocking anesthesia, because we inject all about the area and catch the fine nerve filaments as they pass under the skin and fascia to the part. The injection is made during the advancement of the needle. The anesthetic solution may be used rather freely, care being taken, however, not to render the operative field edematous. The desired intensity of the anèsthesia is reached in from 15 to 30 minutes, and its duration is from one to two and a half hours.

It is well to have an outline of the operative area clearly in mind, for at various points along the outline are established wheals for the purpose of having small anesthetic areas through which one can inject painlessly larger tissue areas. In most places in the body we must inject all layers in the shape of a pyramid in order to block nerves from all directions (see Fig. 1). In the scalp, anterior surface of neck, hand, and fingers the nerves lie in the subcutaneous tissue and a rhombus-shaped subcutaneous injection suffices (see Fig. 2). For best results the disease or condition should lie in a field that can be thoroughly encircled. Our aim is to anesthetize the field at once and not to bother during the operation with further injections. The original wheals must stand out like the bite of an insect, and from these infiltrations are carried out painlessly. Two or more directions may be injected without removing the needle. Having injected the subcutaneous tissue, we now inject perpendicularly to the skin the full depth of the tissue, then in slanting directions till the point of the needle approaches the skin again (see Fig. 1). Resistance in the deeper tissues means fascia, and it is important to infiltrate beneath this layer. In anesthetizing bone, infiltrate all layers down to it. The sensitive nerves lie in the periosteum. Bone itself is practically insensitive.

In the abdomen it is the parietal peritoneum that is sensitive; one can burn or cut the bowel without pain. Dragging on the mesentery, and separating adhesions, cause pain or uneasy sickening sensations. Always infiltrate a larger area than is necessary for the primary incision. The danger of going into the bowel is practically nil; the bowel will slip away, and a thin needle puncture would amount to nothing. If necessary one can further inject the peritoneum after the incision is made. Prof. Bier uses first stage of ether anesthesia ("Aether Rausch") in bringing the diseased organ or part into the wound.

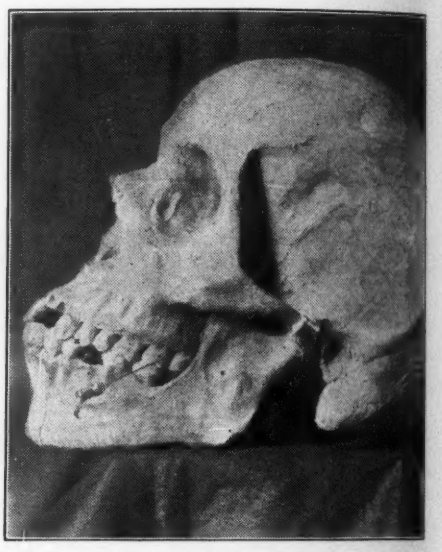
During the operation under local anesthesia the parts should be handled very gently. The patient realizes dragging, pressure, or blunt dissection. His attention may be diverted by having some friend with him. His eyes should be covered and one may stop his ears with pledgets of cotton. The operator should not talk, as unnecessary jest or conversation may impress the patiently wrongly. Hemostasis should be perfect and the blood should not be allowed to run down upon parts not anesthetized.

OPERATIONS ON HEAD.

Cerebellum (*Braun*)—Make a series of wheals, outlining field of operation, beginning at the midpoint on the back of the neck and continuing up beyond the Omega-shaped line of incision back to the other side of the head. Connect up all points. In the neck the injection should be made down to the cervical vertebrae. Use 90 to 100 c.c. of ½ per cent novocain.

Frontal Sinus Operation—Make a skin wheal over suture between nasal bones at their tip ends, another wheal at the side of the nose at the same level, a third wheal over exit of supratrochlear nerve from orbit, one corresponding to the notch of the supraorbital nerve, one at the external angle of the eye, the next wheal about three finger breadths above the last on the forehead, and the last wheal in the middle line of the forehead three inches above the root of the nose. Connect all wheals subcutaneously, using 1 per cent novocain solution. Now at the inner orbital angle introduce the needle along the inner orbital wall to a depth of 4½ cm. and inject 2 c.c.; after withdrawing the needle about 2 cm. inject 1 c.c. more. This injection is made to catch the anterior ethmoidal nerve. In connection with this operation it is advisable that the nasal mucous membrane be painted with 10 per cent alypinsuprarenalin solution. Removal of bone is best done with a rongeur or a burr, because the jar from the chisel often gives patients severe headache.

Operations in Trigeminus Regions—Gasserian ganglion anesthesia: (Hærtel[6], Grinker[7]) Introduce the needle opposite the alveolar process of the second molar tooth, patient's jaw being closed. Then with the finger in his mouth, constantly avoiding the mucous membrane, guide the needle between the coronoid process of the inferior maxilla and the tuber maxillae. Now incline the needle slightly upward, backward and inward until it reaches the plate on the under surface of the sphenoid. At a depth of 6 cm. the needle engages in the foramen ovale. When one strikes the region of the opening the patient has violent pain in the lower teeth. Now push the needle on in 1½ cm., when the patient will experience pain in the upper teeth; then inject 2 c.c. of a 2 per cent solution of novocain-adrenalin and the anesthesia will be complete in a few minutes. (For full description see Grinker's article in J. A. M. A., May 3, 1913.) The after effects sometimes observed by Hartel



Gasserian Ganglion Anasthesia, showing needle in foramen ovale.

were vomiting, faintness, and headache. Under Gasserian ganglion anesthesia may be done resection of either maxilla, any operation on the face or nose, multiple extraction of teeth, removal of the tongue, etc.

METHOD FOR REACHING THE BRANCHES OF THE TRIGEMINUS.

First or Ophthalmic Branch—Make medial orbital injection at depth of 4½ cm., also inject along the lateral wall. The medial wall injection catches the ethmoidal branches; the lateral injection blocks the frontal and zygomatic nerves. Use about 2 c.c. of a 1 per cent solution of novocain on each side of the orbit. (Skull beside patient.)

Second Branch of Fifth Nerve—Infiltrate with 5 or 6 c.c. of a 2 per cent solution. Go in below the malar process to a depth of about five or six cm.; keep close to the tuber maxilla and above the lateral tooth row. To make sure one is not in the internal maxillary artery, put on syringe and aspirate. A skull should always be beside the patient's head. One can also reach the foramen rotundum for this nerve by lateral orbital injection (Hartel).

Third Branch of Trigeminus—This may be blocked in either of two places, at the foramen ovale by the same technic as for Gasserian ganglion anesthesia, or its mandibular branch may be blocked just before it enters the bony canal of the inferior maxillary bone.

Operations on Nose and Cavities—Make a wheal over the root of the nose, two wheals corresponding to maxillary points just below malar; connect the above points and inject subcutaneously to the corner of the mouth. Make medial orbital injection, and inject the maxillary nerves on both sides.

Resection of Upper Maxillary—Block maxillary nerve, make double orbital injection, medial and lateral, and encircle the area subcutaneously. Make a wheal at the root of the nose, pass over the eye to the external angle, from there to the maxillary point, thence to the mouth. From the original wheal pass down the side of the nose and around the nose to middle line of upper lip.

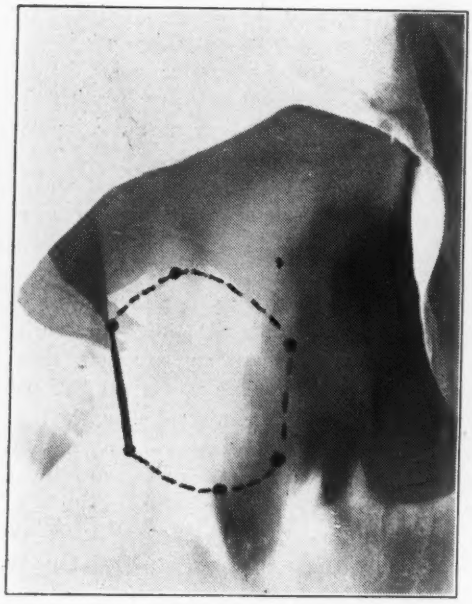
Resection of Lower Jaw or Tongue—Give hypodermic of morphine-atropin, or morphine-scopolamin. Block lingual and alveolar nerves. From a midpoint just above the hyoid bone infiltrate the base of the tongue under the guidance of the left finger placed in the mouth, thus blocking the ninth nerve and making tongue and gums almost bloodless. Paint pharynx with 10 per cent cocaine to obliterate reflexes. Advantages of local over general anesthesia are an almost bloodless field, no preliminary tracheotomy, no preliminary ligation, no packing of pharynx, and less liability to aspiration pneumonia.

Operations in Pharynx—Hirschel[8] sought to anesthetize the ninth and tenth nerves at their exit from the skull. In his technic, as used in four pharynx and tonsil tumors, he makes a skin wheal just back of the articular process of the mandible, close to the mastoid process and in front of the streno-mastoid. The direction of the needle is toward the condyle on the occiput. At a depth of from 3 to 4 cm. he injects 10 to 15 c.c. of a 2 per cent solution. Advancement of the needle is only made during pressure on the piston. If the tumor be removed by external route the neck is also anesthetized. (Skull should be beside the patient.) It is important to remember that the point of the needle is *very* near the jugular vein and the internal carotid artery.

Operations on the Neck—The most important part of the infiltration is along the posterior border of and through the sterno-cleido-mastoid muscle down to the transverse processes. This infiltration plus a thorough subcutaneous and subfascial injection encircling the area gives an excellent anesthesia. From 50 to 60 c.c. of a one half per cent solution should be injected along the posterior border of the sterno-cleido-mastoid muscle. One needs from 120 to 130 c.c. for an operation. If the floor of the mouth is to be included, block both linguals or inject the floor of the mouth from a central point above the hyoid bone. The innervation of the neck is by the auricularis magnus, cutaneous colli and supra-claviculares. These nerves can be blocked at their point of exit where the external jugular vein crosses the sterno-cleido-mastoid, and are caught in the injection along this muscle.

Thyroidectomy—Make a six-sided figure with one side corresponding to the posterior border of the sterno-cleido-mastoid. One point should be over the middle line of the neck at the isthmus of the gland. Inject 50 to 60 c.c. along posterior border of sterno-cleido-mastoid. Connect subcutaneously and subfascially all six points. The common caro-

tid and internal jugular lie behind the tumor out of the way. Only one vein is in danger, that being the external jugular; however, if one should inject this there would be very little danger. Go deep enough and do not be afraid of large vessels, as they lie deep to the tumor and sterno-cleido-mastoid muscle. Infiltrate under the isthmus. The vertical lines of infiltration in the neck are the most important, as they cross the nerves. One hundred to 150 c.c. usually are required for this operation, using 16 drops of adrenalin to each 100 c.c. of novocain solution. Wait at least fifteen minutes before operating. Dragging on the tumor may cause some complaint from the patient that he can not get air. In intrathoracic goitre infiltrate the area; have patient cough tumor out and seize it; carefully break up any loose adhesions and draw it into wound.



Injection for Thyroidectomy.

Laryngectomy—This operation is attended by a greater mortality under general than under local anesthesia because of aspiration pneumonia. The internal branch of the superior laryngeal nerve is of greatest importance here. It runs parallel to the hyoid bone from its posterior edge, sinking anteriorly into the thyroid membrane. It is of great importance to thoroughly anesthetize this structure. Find the hyoid bone, have the assistant push the bone over to the side to be anesthetized; then push the needle deep along the bone, steadily infiltrating postero-anteriorly, using 5 c.c. of a 2 per cent solution of novocain with one drop of adrenalin to each c.c. of fluid, and likewise on other side. If one goes too deep into the larynx or trachea the patient coughs.

Injection for Thoracoplastic (Schede.)

Now make a six-sided figure and make a thorough encircling subcutaneous injection (Umspritzung), using 120 to 150 c.c.

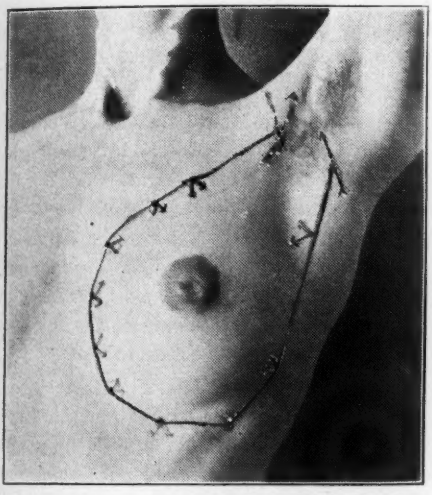
Glands of Neck—Infiltrate behind sterno-cleido-mastoid, form six-sided figure and connect up all points around. Inject several lines across the direction of nerves, thus connecting points up and down the neck.

Operations on Thorax—Braun[8], Hirschel[9], and Schumacher[10] have done extensive rib resections, and Hirschel has done a number of amputations of breast with cleaning out of the axilla.

Rib Resection (Braun and Hirschel)—Make

wheals in interspaces just below the ribs to block the intercostal nerves, and in each space inject 5 c.c. of a 1 per cent solution. Make the infiltration about the field with ½ per cent solution. This method is applicable to as many ribs as necessary, and may be used for lung abscess, emphysema (chondrectomy), and Schede's operation.

Excision of Breast (*Hirschel*[8])—One has to contend with the following nerves: The supraclavicular, intercostal, and the brachial plexus in the axilla. Hirschel says obesity is a contra-indication to the method. Begin in the axilla and completely encircle the breast subcutaneously with a ½ per cent solution. Inject 3 to 5 c.c. in each intercostal space to block the intercostal nerve. Strongly abduct the arm and inject 40 to 50 c.c. of a ½ per cent solution of novocain under the pectoralis major as high up as the first rib to block the brachial plexus. Wait fifteen minutes for anesthesia.

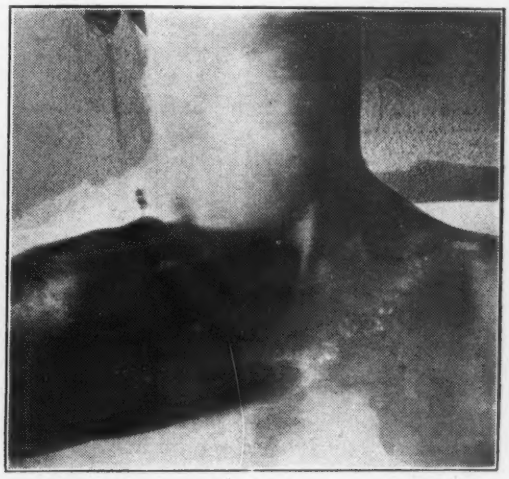


Injection for Amputation of Breast.

Heidenhain[11] did five laminectomies under local anesthesia. He used morphine half hour before the operation, and infiltrated a large area, using as much as 250 c.c. of a ½ per cent solution of novocain for anesthesia.

Brachial Plexus Anesthesia (*Kulenkampf, Hirschel*[12])—This plexus lies lateral to the subclavian artery on the first rib, medial is the pulsating subclavian, in front the clavicle, below the first rib. This anesthesia is fairly easy because of the fixed location and relations of the plexus.

Technic of Brachial Plexus Anesthesia—Find pulsating subclavian and make a skin wheal just to the outer side. Use 4 cm. needle and pass it in the direction of the second or third dorsal spine. Pain in the fingers or elbow occurs when the plexus is struck. Inject from 10 to 20 c.c. of a 2 per cent solution. The anesthesia reaches up to the middle of the upper arm and muscular relaxation occurs from the shoulder down. Use a Martin bandage because of undue congestion of the arm. Sievers[13] reports a case of paresis of the phrenic nerve lasting three days, following brachial injection.

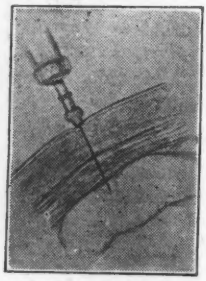


Brachial Plexus Anaesthesia after method of Kulenkampf.

For anesthesia of the sciatic nerve Babitzki[14] passes his finger into the rectum to palpate the nerve, and under this guidance passes a needle through the gluteus muscles directly into it. With the injection of 2 or 3 per cent novocain anesthesia is complete in from three

to five minutes. This procedure is of use also in fractures and luxations.

In fractures the injection of 20 to 30 c.c. of a 1 per cent solution about the ends of the bones produces muscular relaxation and makes reduction painless. In cases of dislocation of the hip Braun[15] injects 25 c.c. of a 1 per cent solution about the head of the bone and 20 c.c., from close behind the anterior superior spine of the ileum, into the acetabulum. Reposition is easier than under narcosis. Deutschlander puts on a bandage above the accessible joints and injects 10 to 20 c.c. of a ½ per cent solution of novocain for the anesthesia of the joint. This method can be used



Bowel slipping away from needle (Liepmann Gynecologie.)

in removing foreign bodies or in fractures into the joint.

Abdominal Wall—Suitable abdominal cases for operation under local anesthesia are those in which we do not have to stir around much in the abdomen, e.g., mild chronic appendicitis, some cases of acute appendicitis in very early stage, also interval cases. (Braun does not operate appendix cases under local anesthesia.) Other abdominal operations that can be performed under local anesthesia are gastrostomy, gastro-enterostomy, enterostomy, colostomy, and supra-pubic cystostomy.

Technic—Make subcutaneous and subfascial injections, then infiltrate under the peritoneum. The beginner is always afraid of going through the peritoneum, but usually he does not go deep enough. If necessary one may infiltrate subperitoneally after the incision is made. One should make a large hexagon, so that if necessary the incision can be made larger. There is little danger of puncturing the intestine, for it slips away. Use 100 to 150 c.c. of a ½ per cent solution. Traction on cecum or mesenterium gives patient sickening sensation. Always precede an abdominal operation with morphine-atropin, or morphine-scopolamin (Colmers[17]).

Hernia (*Nast-Kolb*[18], *Braun*[5], *Keplar-Schliep*)—According to Nast-Kolb old people are particularly suited for local anesthesia. He gives the following contra-indications for the use of local anesthesia: Children, excitable people, and hernias with marked adhesions where much handling is required. Incarceration is no contra-indication. He gives morphine beforehand. Keplar and Schliep give unreducable hernia as a contra-indication because one can not infiltrate underneath the sac. In inguinal hernia the three nerves to be considered are the ilio-costalis, ilio-inguinal, and ilio-hypogastric. In the earlier part of their course they are submuscular, but near the middle line become subcutaneous.

Technic—Make the first skin wheal about two finger breadths above the anterior superior iliac spine, infiltrating across the nerves toward the anterior superior iliac spine and also in the opposite direction. The second wheal is placed one finger breadth below the middle of Poupart's ligament, the third wheal over the spine of the pubis, and the fourth internal to the ring. To complete the rhombus connect all wheals subcutaneously. Now inject deeply into the muscles and subfascially along these lines. From the first point inject subfascially downward to the outside of the external ring, and also to the inside of the external ring. Insert the finger into the canal and inject the structures that form it. Inject the spermatic cord with 5 c.c. of a 2 per cent solution containing five drops of adrenalin 1-1000. Keep steady pressure on the piston while injecting the cord to prevent injury to the panpiniform plexus. It usually requires

from 100 to 150 c.c. of a ½ per cent solution to inject the field.

For femoral hernia make a four sided figure about the tumor, watching always the position and relations of the larger vessels. Keep in mind the saphenous vein also, although no harm would result if one should puncture it. The first wheal should be placed about two finger breadths medial to the anterior superior iliac spine, the second over the spine of the pubis, the third over the junction of the middle and outer thirds of Poupart's ligament, and the last at the femoral opening. Connect all wheals subcutaneously and subfascially. From the second and third wheals inject about the neck of the sac, and from the fourth try to get under the sac. About 75 to 100 c.c. of a ½ per cent solution are required. Braun says that the size and previous condition, whether incarcerated or adherent, make no difference. Nast-Kolb reserves adherent hernias for general anesthesia. Out of a series of 397 herniotomies in Braun's clinic only 52 were under narcosis, and most of these were children.

Kidney Operations (Braun[5], Lawen[19], Kappis[20])—These are perhaps best done under general anesthesia, as bringing the kidney out and traction on the pedicle cause pain. Braun injects a layer at the edge of the quadratus lumborum down to the properitoneal tissue, extending from the twelfth rib down to the ilium, then circumscribes the area subcutaneously and intra-muscularly. Only spare individuals are suited for this method of anesthesia.

Genito-Urinary Operations—Local anesthesia for operations on the scrotum and testicle can be utilized in tuberculosis, syphilis, varicocele, and hydrocele, but is contra-indicated in malignant disease where the glands are to be removed. It is possible to anesthetize the whole external genitalia in the male. Make a wheal at the base of the penis, two lateral to it, and two or three on the perineum. Connect all wheals and inject the area where the scrotal skin joins abdominal skin. The cord is to be injected separately with 5 c.c. of a 2 per cent novocain solution containing 5 gtt. of adrenalin 1-1000. For infiltration of the area about 100 c.c. are required. For hydrocele inject above and below the scrotal partition. Should the sac not be thoroughly anesthetized fill it up with the novocain solution and clamp opening for a few minutes; however, this is rarely necessary.

Suprapubic Prostatectomy—Make a hexagon on the abdomen and inject subcutaneously and subfascially down to the peritoneum. Inject 20 c.c into the space of Retzius. Now inject, under the guidance of the finger in the rectum 5 or 10 c.c. of a 1 per cent solution between the rectum and prostate on each side (Zuckerkandl), and finally fill the bladder with a 1 per cent alypin-suprarenalin solution. Braun utilizes first stage anesthesia ("Aether Rausch") to begin the operation with.

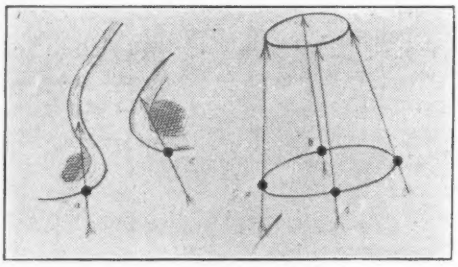
Circumcision—Put a constrictor on the root of the penis; make four wheals and connect around the penis subcutaneously, then infiltrate down to the corpora cavernosa. Do not use too much fluid, as it might cause gangrene from fluid pressure. Do not use adrenalin. To amputate the penis use the above technic plus through and through injections of the corpora cavernosa.

Operation in the True Pelvis (Posner[21], Franke and Posner[22], Ruge[23])—The sensory supply to the pelvis comes from the pudendal and nervus pelvicus. By blocking these nerves Franke had excellent results in prostatectomy, lithotripsy, and cystoscopy.

Technic—From a wheal in the perineum in front and to one side of the rectum inject subcutaneously and subfascially; then, under the guidance of the finger in the rectum, inject the pudendal nerve. One feels for the spine on the ischium, the pudendal nerve lies just dorsal to it. For the nervus pelvicus inject the space between the rectum and the prostate on both sides by introducing the needle in front of the rectum under the guidance of a

finger within. This technic gives anesthesia of the lower part of the rectum, perineum, prostate with the seminal vesicles, bladder, penis, and urethra.

Technic for Hemorrhoids and Fistula—Make four or six wheals about two fingers 6—Local and Venous Anesthesia. ... ... breadths from the anal opening; connect these subcutaneously. This produces anesthesia of the skin. To relax muscles and anesthetize mucous membrane make a cone of infiltration with the rectum as the center. Under the



Haemorrhoid injection (Hirschel.)

guidance of the finger inserted inside inject deeply about the rectum. It requires 100 to 125 c.c. of a ½ per cent solution. Do not dilate sphincter widely, but use retractors.

VENOUS ANESTHESIA.

Venous anesthesia is produced by injecting ½ per cent novocain solution into the veins of a cross section of the limb, between two Martin bandages, the limb having previously been rendered bloodless. The anesthetic solution gradually diffuses through the tissues of the area between the bandages and produces a direct anesthesia from blocking all the nerves in that area, but we also have the great nerve trunks blocked, and this produces indirect anesthesia of the whole limb below. The (direct) anesthesia between the bands is immediate, while the (indirect) anesthesia below comes on about fifteen minutes later. In the arm use the basilic cephalic and median veins; in the leg always use the saphenous. Hemorrhage does not take away the anesthesia because the nerves are blocked. When adrenalin is added to the solution we get only islands of anesthesia.

Venous anesthesia can be used for operations in the middle of the upper arm downward, and from the middle of the thigh downward. Under this form of anesthesia bone work, joint resections, and amputations can be done. Venous anesthesia should not be used in cases of senile or diabetic gangrene. In infected cases operate only in the field of indirect anesthesia. The part is not compressed, but raised perpendicularly and the blood stroked out; then the two Martin bandages are put on above the infected area.

Technic—Paint the whole arm or leg with tincture of iodine. With two or three sterile Martin bandages compress the whole limb up to the place where the central bandage is to be put on. Now at a distance from 5 to 30 cm. distally place the second bandage. Having previously scratched the skin over a vein, we expose it under local anesthesia of a 1-2 per cent novocain solution. Introduce the canula toward the periphery, tie it into the vein, and slowly inject the 1-2 per cent novocain salt solution. It requires from 50 to 70 c.c. for an arm, from 80 to 100 c.c. for a leg, and from 20 to 30 c.c. more in infected cases. Remove the canula and tie both ends of the vein. Patients may complain of pain from the central bandage. This can be relieved by applying a second bandage just below the central bandage after direct anesthesia is complete, and the central bandage may then be taken off. Where two operations are to be done, operate in the area of direct anesthesia first. Sensation returns shortly after removing the central bandage. The operation must be completed before the bandages are removed.

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REPORT OF TWO INTERESTING CASES DIAGNOSED AT OPERATION.

By T. S. Field, M. D.,
Jacksonville, Fla.

Accurate diagnosis is generally considered essential to good surgery. There are cases however, in which our operative findings make our diagnosis appear ludicrous. A careful history, a complete physical examination and analytical examination of the blood and urine ought to give us a fairly accurate diagnosis in most of our cases. And there are many cases in which we can make an accurate diagnosis without these aids. In hospital practice these aids to diagnosis have become routine measures, but in private practice outside the hospitals we are often called upon to make a diagnosis on short notice and in cases in which an accurate history is unobtainable.

I wish to call to your attention two of my mistakes which seemed on opening the abdomen to be particularly inexcusable, and especially so in one of the cases in which I made a second mistake in diagnosis after the abdomen was opened.

Case 1—Patient, a colored woman. Age. 32. Physician, Dr. J. H. Colson, Gainesville, Florida. On September 18, 1912, I was called to Gainesville by telephone, presumably to remove a large multiple fibroid. It was essential that I get back to Jacksonville that night, which I could only do by leaving Gainesville at 3:30 in the afternoon. I arrived in town at 12.50 and drove out to the colored settlement where I was to operate in a negro hut. By close questioning I elicited the following history from the patient and her husband:

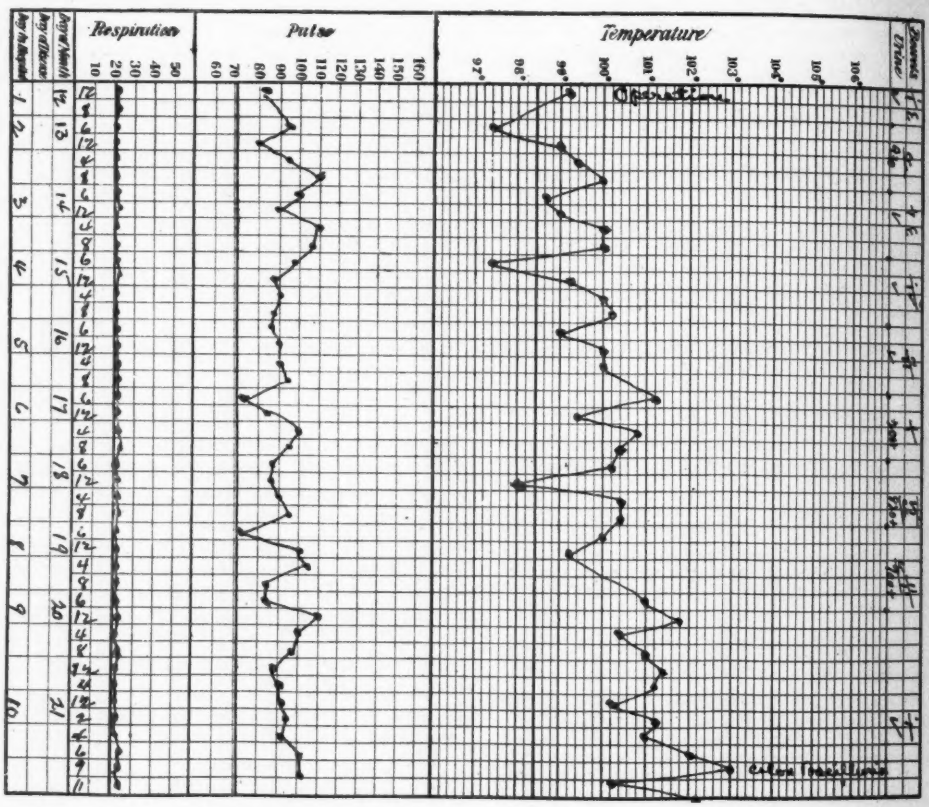
Menstrual History—Regular until six weeks previous to operation, when her regular period came on, from which time she has flowed steadily, using three napkins a day.

Family History—Negative.

Past History—Three pregnancies, with normal deliveries of living children. No history of postpartum infection. No history of abortion or miscarriage. Denies venereal disease. Otherwise, the history was negative.

Present Illness—Has noticed a tumor of the abdomen for a long time. Can't remember how long. Doesn't remember how or when it began. Has grown perceptibly larger in the past six weeks. At her last menstrual period (six weeks ago) she began to have severe cramp-like pains in the abdomen, which were not confined to any special locality, and had an unusually profuse flow. The flow has been continuous since that

time with a continuance of the cramps, and she has been confined to bed. No other symptoms. On examination, there was a slight uterine hemorrhage. The vagina was normal to sight and touch, except for a second degree laceration of the perineum and a bulging of the posterior fornix. The wall at the point of bulging was not indurated, nor fluctuant. The cervix was in position and was fixed. The abdomen was markedly distended and rounded and absolutely dull on percussion except over the epigastrium and in the flanks. A tense tumor mass was made out, extending four fingers above the umbilicus. Just above the pubis a hard mass the size of an orange was plainly palpable.



Acute appendicitis. Congenital cy stic kidney. (Colon bacilluria.)

Provisional Diagnosis—Multiple fibroids of the uterus and a large ovarian cyst.

Operation—The abdomen was opened in the median line and a large cystic tumor exposed to view. It was firmly adherent to the intestines and omentum and hid the uterus from view. In freeing the adhesions, the cyst wall was ruptured, with the resultant escape of a large amount of clear fluid and a live foetus of about six months. The foetus slipped over the edge of the table and its weight tore loose the placenta, which immediately gave me some very active bleeding to attend to. The placenta was attached to the posterior face of the uterus, the sigmoid, the caecum, and small intestines, and had its origin from the remains of the left tube. The mass which I felt just above the symphysis was the uterus itself, which was normal except for a slight increase in size. I was obliged to do a hystero-salpingo-oophorectomy to control the hemorrhage—and I removed the entire placenta. I worked as fast as I could and completed the operation in fifty-five minutes, but the patient left the table in severe shock, from which she never rallied, and she died in twelve hours.

Gentlemen, a stethescope on that abdomen would have made the diagnosis.

Case 2—Patient, Miss F. T. B. Single. Age, 47. Occupation, clerk.

Chief Complaint—Dull ache and tenderness on right side, most marked over McBurney's point.

Family History—Mother and two sisters living and well. No history of specific or nervous diseases. Father died aet. 50 of "diarrhoea." One brother and one sister died aet. 30 of phthisis. One brother died aet. 54 from sepsis, seventeen days post-operative, from nephrectomy for congenital cyst of right kidney. One sister died aet. 42 of pneumonia. Maternal aunt died of carcinoma of breast.

Previous History—Menstrual. First menstruation at age of 14. Regular from onset; q. 28 days; duration, 4 days; flow moderate—used two or three napkins daily, which were saturated. In early menstrual life had irregular pain at some periods. Last period, January 20, 1913.

Never married. No history of intercourse. No history of venereal diseases.

Illnesses—Measles and parotitis as a child. Liable to frequent colds "on the chest." No cough. No night sweats. No history of cardiac or renal troubles.

Present Symptoms—Menstrual. Up to a year ago, menstruation was regular and did not differ from early menstrual history, except that there was no pain. A year ago menstruation ceased and remained in abeyance for six months without any symptoms. Last fall it began again without symptoms and has remained regular, with a duration of two to four days (usually four) and is not as profuse as formerly.

Vaginal Discharge—Has had a slight leucorrhoea for a good many years. Whitish in color, with an animal odor. Diminishing in amount. Not associated with anything, and never worse at stated times.

Nervous and Mental Symptoms—Has had a dull, aching pain on the right side as long as she can remember. Pain is intermittent and only occurs at long intervals. Comes on without warning and lasts only a few minutes at a time, but is very sharp. Goes for months at a time and sometimes a year without this pain. When it comes on, she often has to go to bed for two or three days on account of the intensity of the sharp pains, which have a duration of but a few moments, but recur with frequency during the three days of the attack. Never had one of these attacks to last more than a week. Other than the times at which it was brought on by exercise, it was never associated with anything. Could never run or romp as a child on account of this pain. She seemed to have more continuous trouble with it in childhood, at which time her parents called it a stitch in the side. Headaches began as a child and continued with the characteristics of a hemicrania until two years ago. Used to have intense frontal headaches, with nausea and photophobia, about every ten days throughout life, which have gradually grown less in intensity. For past two years she has not had a bad headache, but has had slight ones regularly. Not associated with menstruation. Apt to be less severe when occurring at this time. Within the last two years her headaches have been associated with menstruation, and come on toward the last day of the flow. No bearing-down pains. No dragging in the flanks. Left side the position of discomfort when reclining, though she does not know why. No other position of discomfort.

Used to be intensely nervous, but thinks she is overcoming it. Nervousness never associated with anything. Never had flashes. No irritability. Is not easily tired. Sleeps well, but wakes up tired a good deal of the time. Emotional control good.

Gastro-Intestinal—Appetite good. Digestion good. No gas. Occasionally has attacks of nausea without vomiting. These attacks have no apparent cause, and are not associated with meals. The nausea is very intense while it lasts. Feeling passes off in a few minutes. It is of very frequent occurrence, she thinks, but cannot tell the number of times it occurs in a month. Never was jaundiced and never had any clay-colored stools. Constipated. No pain with movements. Never has passed blood or mucus with stools.

Urinary—Only very rarely has painful micturition. Does not think she urinates frequently in the day time, but does not know number of times or amount of urine. Has to get up once or twice every night to urinate. Never has passed blood with urine. Has good control and can retain urine for a considerable length of time. Has no active discomfort on retention.

Abdominal Swelling or Tenderness—First noticed an abdominal swelling three weeks ago. Always had a large waist measure. Does not know measurement, but wears a 24 corset. No tenderness of abdomen before present illness.

Never noticed any vaginal protrusion.

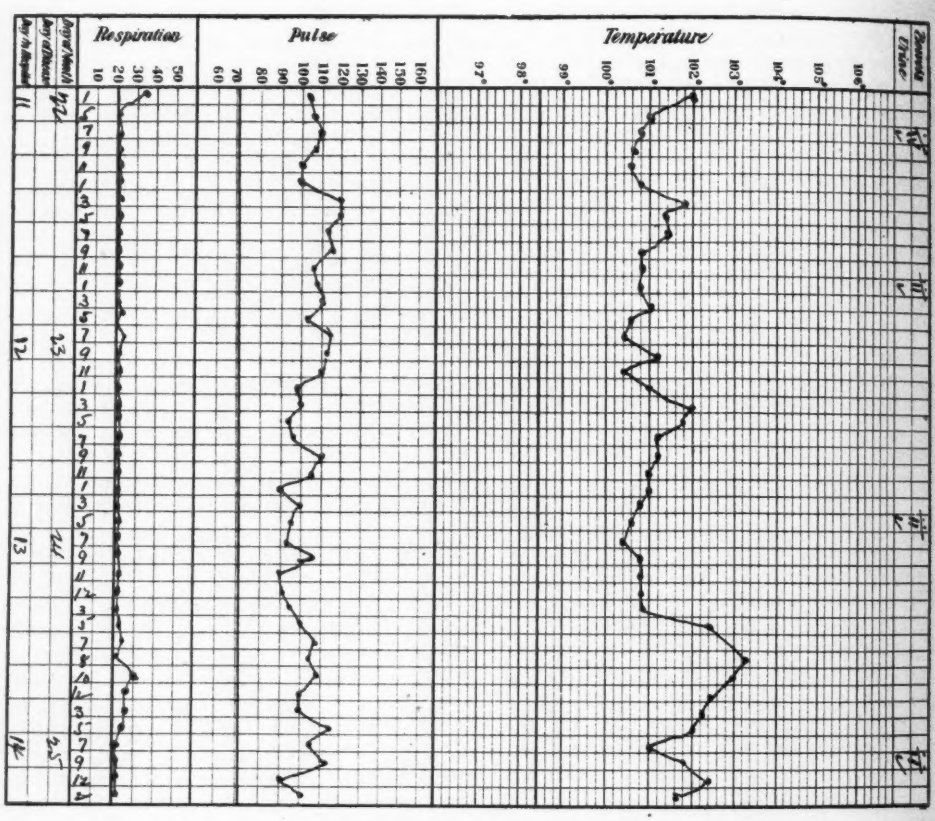
No history of fever or chills. Never had a doctor before this illness.

General Condition—Good. Thinks she has gained strength of late. Maximum weight, 118 as a girl. Average weight, 102. Has not been up

to average for two years. Present weight, 95. Says she always loses weight in South.

Present Illness—January 26, 1913, got up in morning feeling as well as ever and went to church. When she returned to house was doing a little housework and her right side began to hurt and "puffed up like a ball." Rested the rest of the day, thinking that one of her occasional attacks of pain in this side had come on. Toward evening she began to feel better, but swelling would not go down. Worked January 27 and part of the 28th, but had to ask to go home in the afternoon of the 28th. Better on the 29th, and some of the swelling was gone. Went to work on the 30th and worked until the 4th of February, but during the last two days the tenderness was so acute that "she was afraid to have any one come near her for fear they would touch her side." February 5, called Dr. R. H. Dean, who diagnosed acute appendicitis, and advised operation, which she refused, and Dr. Dean was forced to treat her with ice, etc. On February 6, in the night, she went to the toilet and "felt that something broke in that side," and she was at once seized with an attack of nausea and vomiting. Soreness did not get any better.

February 11, I saw her, and her abdomen was



Acute appendicitis. Congenital cystic kidney.

distended and generally tender, with the tenderness most marked over McBurney's point. There was no costo-vertebral tenderness on either side. Apparent muscular rigidity over the entire abdomen, which was most marked over the right side. A large tumor presented in the right illiac region, with its summit at McBurney's point, and extending up to within two inches of the liver. This tumor was plainly outlined at every deep inspiration. Temperature normal and pulse 100. Complained of throbbing pain in the right illiac region.

Physical Examination.

Eyes and mouth, negative. Heart, accentuated aortic; marked arterio-sclerosis. Lungs, roughened breathing in apices; otherwise negative. Breasts, negative.

Abdomen—Tenderness over entire abdomen; most marked over McBurney's point. Rigidity marked over right illiac and hypochondriac regions. Tumor in right illiac region, with summit at McBurney's point, and extending up to within two inches of liver. Liver, negative. Spleen, negative. Kidneys, not palpable.

Glands, negative.

Reflexes, normal.

Extremities, normal.

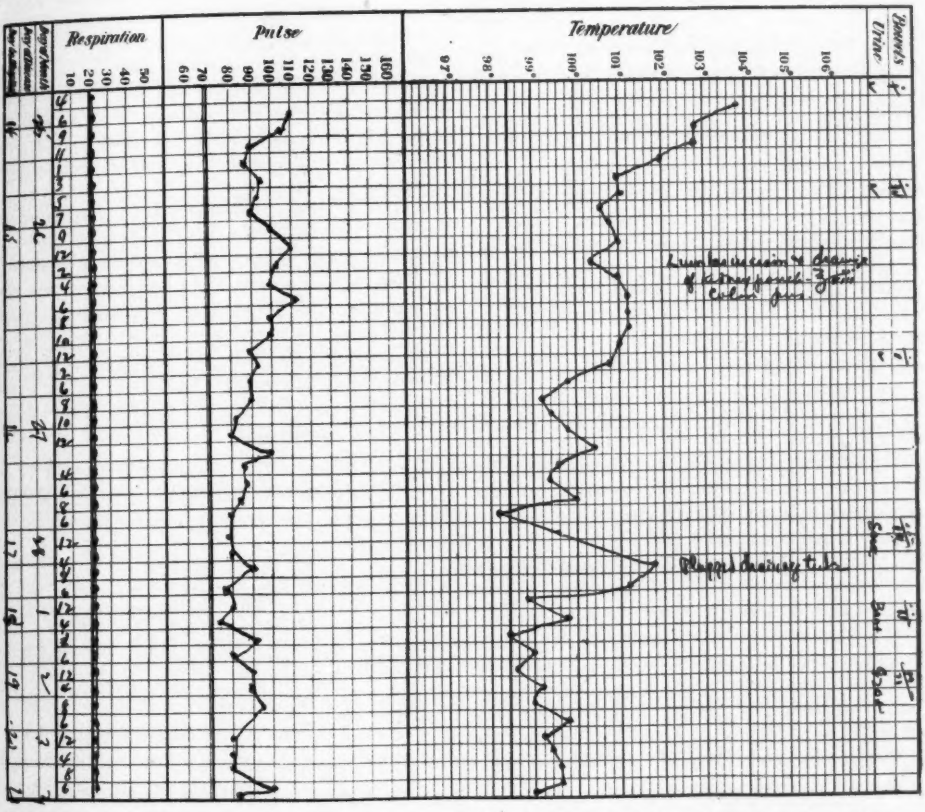
Genitals—Vulva, normal. Hymen, intact. No vaginal examination.

Provisional Diagnosis—Appendix abscess.

Operative History.

Date, February 12, 1913. Anaesthetic, ether. Duration, one hour and fifteen minutes. Assistant, Dr. J. K. Simpson. Anaesthetist, Dr. Baumgartner.

Abdominal Findings—Uterus in position and studded with small fibroids about the size of peas, which were subserous. Adnexa, normal. Stomach normal. Gall bladder, liver, small intestines, large intestines, left kidney, and left ureter, normal. Appendix enlarged and acutely inflamed. Right kidney cystic, extending from brim of true pelvis to under surface of liver, and from kidney fossa to median line, causing a prominent tumor, which stood out on the abdomen when under the anaesthetic like a fibroid. Right ureter atrophied.



Acute appendicitis. Congenital cystic kidney. (Colon bacillus infection of kidney pouch.)

No evidence of obstruction. Abdominal cavity free from fluid of any kind.

Description of Operation.

McBurney incision two inches long. Appendix presented in wound and found to be much enlarged and elongated and acutely inflamed with a thickened and engorged meso. To the left of the caecum a blue cystic mass appeared, which apparently arose from the pelvic viscera. Incision not large enough to admit hand, and diagnosis of ovarian cyst made. Appendix incision closed in layers and median incision made. Upon opening the abdomen the adnexa were found to be normal and our mass proved to be a large cystic right kidney. Appendix removed and posterior layer of peritoneum split and the kidney freed from adhesions. The tumor was too large to deliver en masse. The abdominal cavity was packed off and the cyst incised and drained of a clear yellowish fluid of an ammoniacial odor. Pedicle tied off with two ligatures of silk and shell of kidney removed. Abdomen closed on layers after closure of kidney space. No drainage. Both abdominal incisons healed by primary union and sutures removed on sixth day.

The patient began to run temperature directly after operation. This temperature gradually rose until it reached 103 on the tenth day post-operative. Her pulse stayed below 100 until the ninth day, when it rose to 110. There was no abdominal tenderness. Her abdomen was scaphoid and her bowels moving regularly. On the tenth day I had Dr. Holden see her in consultation and he could not find any evidence of pus collection. I found colon bacilli and pus in the urine and put her on acid sodium phosphate gr. xxx, and hexamethylenamine gr. x q. 4 h., on February 21. On the 24th her urine was clear, without any trace of colon bacilli and with but a slight trace of albumen. At no time were there any casts present. I examined her daily very carefully and found no evidence of infection until the 25th. On the 20th she developed a small spot about the size of a silver dollar over Poupart's ligament on the right, which was crepitant, and I thought she had a gas bacillus infection. This spot did not increase in size and was not tender. On the 25th I found tenderness over the right side and costo-vertebral tenderness on that side, with rigidity of the muscles and a temperature of 103.8 and a pulse of 120. Dr. Boyd saw her with me and agreed with my findings, and I opened her through a lumbar incision end found a collection of liquified blood, with the colon bacillus infecting it, and drained about six ounces of it out of the fossa, and inserted tube and cigarette drains. Her temperature has come down steadily since that date, with the exception of one rise, when the drainage tube became plugged.

In this case I missed an enormous tumor of the kidney and diagnosed an appendix abscess without temperature or pulse. I missed the diagnosis again when I had the abdomen opened, and that was unfortunate, for I could have worked through the lateral incision with much more facility had I diagnosed the condition. I missed a colon bacillus infection for nearly two weeks and allowed pus to accumulate in the kidney fossa. This case was not carefully enough studied. With a normal temperature and only a slight rise in the pulse rate, I did not need to hurry the operation, and should have studied the case more closely.

I have learned several things from these two cases. When in doubt in diagnosing abdominal tumors I will in the future apply a stethescope to them. I think I will study non-urgent cases more thoroughly in the future. I will not make two abdominal incisions when one will do. I will not always look for chill and a high pulse as a sign of pus post-operative. And I will be more careful with my histories and physical examinations.

122 E. Duval St.

BACTERIN THERAPY IN DISEASES OF THE SKIN.*

By H. H. Hazen, M.D.,
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Bacterin therapy is not as yet firmly established, despite the fact that there are many men who are wildly enthusiastic over it, just as many others were wildly enthusiastic over salvarsan when that drug was first introduced. On the other hand, there are many signs of a reaction against the use, or rather let us hope the abuse, of bacterins. Some excellent men, even some of Wright's own pupils, go so far as to deny that bacterial vaccines are ever of the slightest value.

*Read by title in Section on Surgery of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

For such discrepancies of opinion there are at least two excellent reasons: First, because in the words that Osler is so fond of quoting, "Experience is fallacious and judgment difficult"; and, second, because we know neither the best way to make or use bacterins. As a proof of this latter assertion permit me to note a few points concerning which we are still ignorant.

1. We are not yet certain whether autogenous bacterins should always be used, or whether stock preparations are sometimes allowable. In fact, it has even been suggested that the injection of an albumin, such as egg albumin, is really the essential factor.

2. We do not know whether the bacteria should be killed by heat or by some chemical preservative, or whether, as suggested by Hirschfelder (1) they should be digested by ferments so as to make sure that all of the endotoxins are extracted. Nor do we know the relative values of filtrates and precipitates derived from the cultures.

3. We are still ignorant as to whether they should be preserved by placing dependence upon asepsis alone, or whether an antiseptic should be added.

4. Concerning many of the bacterins we do not know either the correct dose or the proper interval that should elapse between injections.

5. And lastly, we do not know whether bacterins should be given by injection alone, or whether they can be successfully employed by mouth or rectum, or in the form of ointments, or even administered locally by the use of the positive pole of the galvanic current.

Many of the facts that we do know are pointed out in a series of special articles that appeared recently in the *Journal of the American Medical Association* (2). Care must be taken that the infecting organism be known, that the bacterin used must be sterile, and that the interval elapsing between injections be sufficiently long so that a "negative phase" is avoided. The use of bacterins containing more than two organisms is usually to be condemned inasmuch as the surplus is unnecessary. There is no object in using shotgun preparations; their use is intended simply for those who cannot or will not make a bacteriological diagnosis. Of course other forms of treatment are not to be neglected, and an effort should always be made to induce passive hyperaemia of the affected area on several days after treatment.

But it is not the intention of the writer to dwell upon these fundamental points, but rather to give his own experience with the use of bacterins in cutaneous disorders, an experience derived from five years' use of these preparations in Dr. Gilchrist's dermatological service at the Johns Hopkins Hospital, and from the use of them in his own dispensary at the Freedmen's Hospital in Washington, as well as in private practice. Dr. Gilchrist (3) has already published many of these observations, but it can do no harm to supplement them with later findings.

Acne Vulgaria. In the vast majority of instances the acne bacillus, described under different names by Unna, Sabouraud and Gilchrist, is responsible for the non-suppurating lesions, and a staphylococcus for the pus formation. It must always be remembered, however, that as pointed out by Varney (4), acne may be due to some other organism.

My experience, extending over more than 100 cases that have been followed for many months, confirms the findings of most other dermatologists, in that it has been found that the staphylococcus bacteria will clear up only the pustular lesions, and will not affect either the nodular lesions or the formation of comedones; whereas in certain cases the use of a vaccine from the acne bacilli will have a marked effect upon them. I am inclined to think that the bacterins made in the Johns Hopkins Hospital from acne cultures grown by Dr. Gilchrist had a somewhat better effect than the commercial preparations, but this is a very difficult point to decide, for at times the latter act beautifully. Various

doses are recommended by various observers, many advising that the initial dose be not over 3 million. In our work with the acne bacterin we at first used initial doses of 200 million, and only seldom saw bad results. To me it seems that the average initial dose should be from 15 to 20 million, and that this dose should be increased by about one-third at each injection until from 150 million to 250 million dead bacteria are injected each time. It is sometimes very difficult to decide upon either the correct dose or the correct interval, and each patient is a problem to be studied. Some patients do better when a small dose is frequently administered, and some do better under comparatively infrequent injections. In pustular cases the staphylococcus albus bacterin may be combined to advantage.

It may not be amiss to quote from the histories of several cases in order to illustrate the benefits that may be derived from this form of treatment.

Case 1. School girl, aged 19, had an acute acne of one month's duration, which was entirely cured by one dose of acne bacterin of 250 million.

Case 2. School teacher of 23, had a very persistent acne of seven years' duration. When doses of 50 million were given at intervals of five days the face remained entirely clear, but if a larger dose was used, or if a longer interval was allowed to elapse between doses, there was a marked relapse.

Blastomycetic dermatitis. Dr. Pels has treated four of these cases from the clinic of Dr. Gilchrist, using as vaccine the filtrate from a culture of one of the cases. In three of the patients the results were excellent, but in the fourth there was practically no benefit.

Dermatitis herpetiformis. Two very severe cases of this malady that had attended B. Gilchrist's clinic for many years were apparently cured by the use of staphylococcus albus bacterin, although all other remedies had proven of no value. Engmann (5) states that he failed to improve a case by the same treatment.

Eczema. Believing that most eczemas, except those directly due to some external irritant, are either excited or aggravated by staphylococci, due allowance being made for a lowered resistance, it was natural to try bacterin therapy upon these conditions, and in general the results have been gratifying, although the old indurated eczemas have always failed to respond. Dr. Gilchrist has told me that he has had some marked results in weeping and pustular eczemas. Some of my best results have been in the erythematous and papular types where there was no weeping.

Case 1. Negro male, aged 30, a head waiter, had a very severe erythematous eczema of scrotum for nearly a year, and was in poor physical shape from loss of sleep. No form of external or internal treatment had proven of lasting benefit. After the third dose of albus bacterin the itching began to abate, and after the tenth dose it entirely disappeared, only to reappear in two weeks after treatment was discontinued. The patient was under observation for two years, and the eruption and itching would invariably reappear whenever treatment was stopped. Finally as the result of six months' steady treatment the condition has been normal for the last two years. As in numerous other cases of eczema this patient had many follicular pustules, which also cleared up under treatment.

Case 2. The wife of a physician, a woman aged 30, had suffered from a papular eczema of one axilla for three years. In less than a month it was entirely healed by albus bacterins, to recur again as soon as treatment was stopped. Just as in the last case this was shown on at least three separate occasions.

Case 3. A white girl, aged 4, had been subject to repeated outbreaks of rather severe vesicular eczema for two years, rarely being entirely free from the affection. Four

small doses of albus bacterin were used, and up to the present time, a lapse of three years, there has been no return.

Gilchrist considers that he has greatly benefited many cases of severe seborrheic dermatitis by the use of large doses of the albus.

Erythema multiforme and Urticaria. Both Gilchrist and I have used staphylococcus, streptococcus and colon bacterins in this group of cases, and the experimental work seems worth carrying on, especially as certain cases of chronic urticaria do seem to respond to some one of these organisms, even when all other treatment is of no avail.

Erysipelas. King Smith (6) and Whitfield (7) both report excellent results from the use of streptococcus bacterins.

Favus. Persson (8) has reported a case of extensive favus in which the use of an autogenous bacterin resulted in the complete disappearance of all lesions.

Furunculosis. When one considers that a boil runs a definitely self-limited course it is hard to believe that the use of bacterins can change the individual lesions, and indeed clinical experience rather seems to bear this out; but the appearance of more lesions can often be prevented, especially by the use of autogenous bacterins.

Pemphigus foliaceus. In a case of my own (9) obviously due to the bacillus pyocaneus an autogenous bacterin failed to help; in fact, each injection caused a fresh outbreak of vesicles. Sutton, in a personal communication, reports that he has almost cleared up the skin lesions in a case of his own by the use of an autogenous bacterin made from the B. pyocyaneus.

Ringworm. The vaccine therapy of the various types of ringworm infection have been chiefly studied by the Germans, the report by Bruck and Kusunoki (10) being one of the best. They report a series of cases cured by the use of autogenous vaccines, especially cases of the deep type so apt to occur in those working around horses. Inasmuch as the only thoroughly satisfactory method of treatment in the cases of tinea tonsurans has been epilation by the X-ray it may be that we have a new and valuable weapon for our armamentarium. If the vaccine is of service in the cases of nail infection it will be a great help to us all, although I fail to see how antibodies can well reach beneath the nail.

Seborrhoea. All who have treated seborrhoea of the scalp with either the acne bacillus or the albus have been rather disappointed in the results obtained.

Sycosis vulgaris. In sycosis of the face and body I have usually been disappointed by the use of bacterins, even the autogenous ones, although some other authors have reported many cures. In two cases of sycosis of the scalp the effects of autogenous bacterins have been very encouraging.

Tuberculosis. Tuberculin therapy had always been a disappointment in cases of lupus. MacKee, in a recent paper read before the American Dermatological Association, records some fair but not especially striking results from its use in cases of erythema induratum.

Thanks to the courtesy of Parke, Davis & Co., Gilchrist and I have recently had the opportunity to try the use of dead cultures of the albus incorporated in a base of anhydrous lanoline. While the work is still in the experimental stage we both feel that in some cases of eczema we have gotten very good results. Of course, we have always tried to control our cases by the application of the base to similar lesions in the same patient. For several years some of the English dermatologists have used tuberculin ointment in the treatment of lupus, with, it is claimed, beneficial results. Gilchrist also reports some benefit derived from this mode of treatment.

Recently Dr. Manning (11) of Washington has used the old tuberculin in one of my cases of lupus in the following manner: The tuberculin was diluted with Lugol's solution and applied locally to the affected parts, being driven in by the positive pole of a gal-

vanic battery. In this case the results were excellent, but of course there remains the possibility that the beneficial action may have been due to the iodins.

CONCLUSIONS.

1. While still ignorant concerning many fundamentals of bacterin therapy we must admit that it is frequently of great service in certain diseases of the skin.

2. Bacterins are very useful in acne, eczema, furunculosis, dermatitis herpetiformis, blastomycosis, ringworm, sycosis of the scalp, erysipelas and seborrheia dermatitis.

3. The colon bacterin may be of use in erythema multiforme and urticaria.

4. In acne, eczema, furunculosis and dermatitis herpetiformis it is allowable to start at once with stock bacterins; in other cutaneous conditions it is first necessary to identify the infecting organisms.

5. Bacterins are only an aid and should never be used to the exclusion of all other remedies. The dosage and interval must be determined for each patient, care being exercised to avoid a "negative phase."

6. Passive hyperaemia should be induced after each injection.

7. Bacterin ointments may be useful in some conditions.

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Next Meeting, Richmond, Va., Nov. 9, 10, 11, 12, 1914.

THE NEW WARFARE AS EXEMPLIFIED BY THE VICTORIES OF GORGAS OVER TROPICAL DISEASES.

The February issue of this JOURNAL had a brief editorial referring to the universal satisfaction because of the prompt recognition by the Government of the splendid services rendered by Dr. Gorgas in his successful battle with what seemed the most hopeless problem in sanitation that ever confronted the human mind.

The exigencies of publication prevented the devotion of sufficient space for the expression of appreciation felt by this JOURNAL for such magnificent work, and it takes this opportunity to add a few words to what was said before.

It is unnecessary to refer in detail to the many forms in which the ability and energy of Dr. Gorgas have been manifested. Not only in every part of this country, but in every region of the civilized world they have been recognized and praised.

It has happened to few men who have devoted a lifetime to some great endeavor to achieve such perfect success and such universal recognition. In his thirty-five years of service he has seen wonderful things accomplished. During that time submarine telegraphy has been perfected, the wireless has established itself as a permanent institution, the telephone has taken its place in every household, aerial navigation has been adopted by every civilized nation, electric locomotion has girdled the earth, and many other wonderful and apparently impossible things have been accomplished, including the digging of the great canal.

Yet not one of these epoch-making developments is equalled in value to the achievement by Dr. Gorgas in sheathing the flaming sword at the gate of every tropical Eden where hitherto the white man could only enter at the extreme peril of his life. True, Dr. Gorgas did not invent the weapons with which he won

the victory, nor did Napoleon invent gunpowder or firearms. Each in his own way, however, demonstrated a mastery of his art, and taught the nations how to conquer.

The immense areas of fertile territory on every continent now opened to population by the white man by the demonstration of sanitation by Dr. Gorgas will more than double the sustaining power of the earth for its population.

Such an achievement is surely greater than that of a Napoleon who drained his country of its best blood to support his towering ambition, or of an Alexander, who wept because he could find no more worlds to conquer or races to slaughter.

No medal or title that a grateful nation or a thankful world could bestow in recognition of such achievements would be equal to its merits.

AMERICA'S HOT SPRINGS.

It is said that the German "water cures" have attracted more visitors to that country "than all the beauties of the Rhine, all the arts of the German galleries, and all the sciences in the famous German schools." Why? Simply because most of those visitors are physically improved by their sojourns. Whether the beneficial agency resides in the water, the air, the diet, the exercise, or the environment is beside the question. The visitors get better, and they advise their friends to follow their example; and the tide sets that way.

Now we have in this Southern part of the United States of America a place which, in the elements requisite for a great natural water cure, surpasses anything to be found at any European spa. There are springs of every size, kind and degree, some hot enough to cook eggs, others cold enough to give one the toothache; some are simply pure water, hot and cold; some effervesce and sparkle like the soda water, and some fume and steam with odors "hot from Tartaras." The settings are worthy of the gems. Wild mountains rise on either side, caves and cliffs are there, and the hills are sometimes heard to groan as if in pain. To this resort have flocked for many generations the lame and the halt, the syphilitic and the rheumatic, and found relief, of course with proper medical aid and direction, and as one result some of the most competent, cultured doctors in the United States are to be found there. And the place belongs to the people of the United States and not to any firm or trust or syndicate; for long ago our Uncle Samuel set Hot Springs, Ark., aside as a government reservation, and placed a good man, recently deceased, to take care of it; and then forgot all about it. As time wore on a hospital was built for the army and navy. Then the Jewish B'nai B'rith society erected a sanatorium for its ailing members, and the Masons are preparing to do likewise. Other fraternal orders are said to be contemplating putting in their applications for concessions. But Hot Springs is worthy of more care than this from the government. It should be made capable of caring comfortably for many thousand invalid citizens. Hotels, theaters, libraries and places for recreation and amusement should be erected by the government, all according to some definite plan created by some artist-architect with a soul big enough to see the possibilities. A fire recently cleared the way for such an undertaking by destroying large areas of the old city of Hot Springs, and no irrevocable concessions should be made that might in the future interfere with the harmonious development of this Carlsbad of America.

NATIONAL DRAINAGE CONGRESS.

SECTION ON MALARIA ERADICATION.

Quite an important item in the organized effort to eradicate malaria is the organization above mentioned, particularly the section indicated. The officers of this section are Dr. Oscar Dowling, Chairman, and Dr. William H. Deaderick, Secretary. These gentlemen

are known all over the South, and in fact all over the country for their energy and ability, and their devotion to the cause of public health. Under their generalship at least their section of the Congress cannot fail to be a success. The place of meeting is Savannah, Ga., during the month of May.

Below is a list of the subjects to be discussed, so far as determined up to the time of this publication. Of course this is only the beginning of the program:

1. A Plan for a Campaign Against Malaria.
2. Suggestions for Raising Funds to Finance a Campaign Against Malaria.
3. The Importance of Education and Publicity in Fighting Malaria.
4. A Malaria Survey of Blank with Cost Estimates of Needed Prophylactic Measures.
5. Rice Culture and Malaria. Is Legislation Needed?
6. The Cost Through Malaria of the Overflows of the Blank River.
7. The Prevalence of Malaria Bearing Mosquitoes in Blank and the Preventive Measures Needed.
8. The Endemic Index in Blank.
9. The Geographic Distribution of Malaria in Blank.
10. Method of Computing the Economic Loss Through Malaria.
11. The Economic Loss Through Malaria in Blank.
12. The Relation of Drainage to the Prevalence of Malaria.
13. What the Malaria Section Can Do for the National Drainage Congress.
14. What the National Drainage Congress Can Do for the Eradication of Malaria.

ACHLYA MUSCARIS AND THE KLEBS-LOEFFLER BACILLUS.

In the *Medical Record* (January 10, 1914), appears a very interesting article by L. L. Ten Broeck, M.D., of Minneapolis, Minn., in which the author gives, with some detail, the results of his studies on the effect of the spores of a certain thalloyphytic fungus on the bacillus of diphtheria. The author indicates that the work is not complete, and that further research is necessary. He thinks, however, that enough has been done to prove that when a throat that is infected with diphtheria is inoculated with the spores of *achlya muscaris* the pathogenic bacilli promptly disappear, leaving the field in undisputed possession of the harmless achlya. Several points are noted that are very important. One is that the remedial spores do not travel about like leukocytes, but have to be carried from place to place like bacilli. Therefore, the remedy, to be effectual, must be placed upon, or in immediate proximity to, the bacilli. Hence it is difficult to inoculate the affection when in the nose. Again, the achlya is not a destroyer to all cocci, especially streptococci, but seems efficient in local affections caused by the diplococcus pneumoniae. He claims, however, that it "possesses the power of destroying the B. diphtheriae in culture and in the throat," and the clinical symptoms subside on their disappearance. Also it "inhibits the growth of a number of throat pathogens." He says: "Its clinical use seems attended with no danger, but after-treatment with mild antiseptics is recommended to remove the fungus." Also that, "It is admirably adapted to the clinical requirements for prompt and ready use."

There is another condition in which achlya would be a godsend, if its usefulness is confirmed, and it is this: When a patient has received a prophylactic dose of antitoxin in horse serum, and after the immunity has expired develops diphtheria, it is then that there is danger of the dreaded anaphylaxis if more antitoxin in horse serum is injected. Under such circumstances achlya would be a welcome substitute. Its further development will be earnestly watched by our profession. Dr. Ten Broeck deserves commendation for his work and the modest way in which he has reported it.

**GENITO-URINARY DISEASES AND SYPHILIS.

This is the title of a book recently published in its second revised edition, and it deserves

**"Genito-Urinary Diseases and Syphilis," by Edgar F. Ballenger. M.D., assisted by Omar F. Elder. M.D. "The Wassermann Reaction," by J. Edgar Paullin, M.D. Second Edition, Revised. 529 pages, 109 illustrations. E. W. Allen & Co., publishers, Atlanta, Ga., 1913.

special mention, not only for the excellence of the subject-matter presented, but also because it represents a new interest among professional men of the South in contributing their experience and observation in a definite and serviceable form to the rapidly advancing medical science. Dr. Edgar F. Ballenger, of the Atlanta Medical School, a member of the Southern Medical Association, and editor of the *Journal-Record of Medicine,* and Dr. Omar F. Elder, have carefully encompassed within 529 pages the subject of genito-urinary diseases in all its modern and recent aspects. In addition to the usual diseases and their complications, the authors describe the latest diagnostic and therapeutic methods, as well as operative procedures in such conditions. It is essentially a work on genito-urinary diseases, and not primarily a treatment on venereal diseases. Written in a clear, straightforward manner, and being well illustrated, it presents an appearance highly complimentary to the authors as well as the publisers.

A very interesting fact is, that this book is one of the few books written by Southern physicians to be published in the South. It is very gratifying to see this professional advance in the South, and the field, which is just being opened, will find many valuable scientific contributions in the future.

IMPROVEMENT IN THE CENSUS REPORTS.

In the Bureau of the Census at Washington, those States and cities in which the registration of deaths is approximately complete, are included in the records as belonging to "the registration area." In 1900, 40.5 per cent of the entire population were embraced in the registration area, which in 1912 was increased to 63.2 per cent. To the credit of Dr. Cressy L. Wilbur, Chief Statistician in the Department of Vital Satistics of the United States Census Bureau, be it said that interest in the important matter of vital statistics is increasing at a gratifying rate, and is especially widespread in the South. Virginia has just been admitted to the "registration area," Maryland was admitted in 1906 and Kentucky in 1911, and Mississippi, Arkansas, North Carolina and Tennessee are seeking to earn admission. Georgia and South Carolina are considering the passage of the "model law," and the other Southern States will, ere many years, take the few steps necessary to enable the bureau to place them on record without the necessity of inaugurating a different style of bookkeeping for each State, as must be the case unless all adopted one uniform system.

A new and sensible feature in the statistics released by the breau at frequent intervals for publication, is the placing of a star, or asterisk, opposite the names of cities with large proportions of colored populations. The death rate in such cities is largely increased by that class of residents, and the mark suggests the propriety of making allowances for that condition. In running the eye down the columns of death rates for cities of 100,000 population and over, whenever the figures indicate a very heavy death rate a glance at the name of the city invariably reveals the significant star.

One cheering item in the leaflet from which the above information is gleaned (released December 31, 1913), states that in the last decade the typhoid fever rate *has been cut in half,* "though it is still higher than in some European countries."

THE WOMAN'S AUXILIARY OF THE SOUTHERN COMMERCIAL CONGRESS.

Among the many new activities assumed by organizations of women the one mentioned above promises to the South the widest and most general usefulness. From its name one would infer that its efforts were confined to mercantile conditions, but such is by no means the case. The noble women interested in this movement lend a helping hand to all worthy educational propositions, to domestic better-

ment in country homes, and are especially efficient in their advocacy of better sanitation in schools and more satisfactory safeguards for public health.

The Honorary President-General is Mrs. Woodrow Wilson. President-General, Mrs. Thomas M. Owen, of Montgomery, is the daughter of a distinguished statesman who is at present Alabama's only Senator, the Hon. John H. Bankhead, and inherits his ability as an organizer and in mastery of detail. Though a woman of force she is full of the simple dignity and kindly consideration that distinguish the "Brahmin type" of the Southern lady the world over, and fits her alike for the service of the unfortunate and the society of royalty. The Vice-President General is a physician, Dr. Lillian W. Johnston, and is in every respect a suitable coadjutor for her superior officer.

Such an organization as the Woman's Auxiliary will do an immense amount of good in improving health conditions in the rural districts of the South, and will add to the luster already pertaining to the character of true Southern womanhood. The Southern Medical Association, at the recent meeting in Lexington, passed resolutions endorsing the plans for the improvement of health conditions in the rural districts of the South as submitted by the Woman's Auxiliary of the Southern Commercial Congress. County and State boards of health, as well as the medical profession generally, should co-operate with the self-sacrificing women who are working to make those who live on Southern farms healthier and happier.

THE 1914 MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Members of the Southern Medical Association who were at the Jacksonville meeting in 1912 can never forget the royal manner in which the doctors of Florida entertained them. Those who enjoyed that occasion and can contrive an opportunity to go to that hospitable city from 23d to the 28th of next November will justly consider themselves fortunate. The American Public Health Association meets in Jacksonville in November, 1914, and the physicians of the city and State are planning to hold a Southern Health Exhibition in connection with it.

There are many health problems in the South which are more important to that part of the country than to any other, and there are few State, county or municial health officers who do not at times feel the need of consultation with their fellow workers. The habit of holding conventions of those engaged in any particular line of work is just beginning to develop in the South, though in other parts of the country it has long been found of great usefulness. Of recent years, however, this part of the country has awakened to the opportunities thus presented, and in every Southern State there are annually gatherings of this kind of more or less importance. The opportunity for special study along health lines presented by the meeting of a national body has been seized by the Florida doctors, especially those of Jacksonville, to call together as many of the physicians in the South as can come at that time. There they will meet the most prominent health workers from all parts of the United States, as well as from Canada, Mexico and Cuba, and the exchange of views and experience, and the discussions arising, cannot fail to amply reward every earnest student of public health matters that attends.

THE JOURNAL prophesies a royal reception and immense benefit to all participants.

WALKER COUNTY'S WHOLE TIME HEALTH OFFICER.

Walker County is one of the most noteworthy civil subdivisions in the State of Alabama. Its wooded hills and fertile valleys are populated by strong men and beautiful women, who are full of energy and the spice of life. At one time, and possibly even now,

its county seat, Jasper, boasted of more beautiful blondes and of fatter men than any other rural community in the State, to say nothing of a town pump to which you could go at night and fill your bucket by the light of inflammable gas that came up with the water. Its hills are full of coal and iron, and deep borings reveal the presence of illuminating gas in supposedly commercial quantities, and its citizens are served by a body of medical men who will compare most favorably with any other. But its most valuable possession is a broad spirit of wisdom, which has demonstrated a rare balance of conservatism and enterprise that leads to civic prosperity and avoids civic errors, together with an abundant courage to inaugurate new expenditures along the line of its convictions.

The foregoing reflections are inspired by the action of the Walker County Board of Health in appointing an outsider, a sanitary expert, who, though a graduate in medicine, is not even a practicing physician, to the position of County Health Officer, and paying him a salary of $2,500 a year, with an extra $500 for expenses. There are plenty of good doctors on that board, who are also good men and fine fellows, some of whom have never collected $3,000 in any one year of hard work in all their lives, but if they wanted the place they showed no signs that have reached the public. What they wanted was efficiency, and they went for it to headquarters. Dr. Grote, whom they selected, has been working in the Alabama State Board of Health for several years, doing field work, and has won a great reputation. What an expert pitcher is to a baseball team, an efficient county health officer is to the board of health in every county. Such a man demands a living salary, and he is worth it.

Dr. Grote has gone to work with a systematic direction of energy that promises great results. He will have his hands full, counting general sanitation, hookworm, typhoid, trachoma and the extermination of flies and mosquitoes; but he is the man for the place, and his appointment by the board and the approval by the county officials is a "proof of wisdom" that is undeniable.

Five thousand readers of the JOURNAL wish him "good luck."

CONCENTRATION IN PUBLIC HEALTH WORK BY THE MARENGO COUNTY MEDICAL SOCIETY.

That Nestor of the medical profession in Alabama, Dr. J. B. Whitfield, of Demopolis, calls our attention to the work accomplished by the Marengo County Medical Society, of which he is President.

Realizing that it was not possible to cover the entire field of preventive medicine in one year, the members of the Marengo County Medical Society decided to concentrate their efforts in work to destroy flies and mosquitoes. The aid of the newspapers in the county was invoked and a number of articles appeared on this subject in the county papers. The Health Officer delivered lectures to the people and the doctors instructed their patrons as to the necessity for destroying breeding places of flies and mosquitoes and also for screening their homes.

It is said that last year, as a result of this campaign, a carload of fly paper was sold in Marengo County, more homes were screened than ever before, and more puddles, ponds and other breeding places for mosquitoes were drained than ever known in the history of the county. The physicians noted a marked decrease of the number of cases of typhoid fever and malaria. The report of the County Health Officer, Dr. W. H. Abernathy, also shows a decrease in the death rate from typhoid and malaria. The Marengo County Medical Society does not propose to let up on the mosquito and fly in 1914, but they are also planning a campaign especially against tuberculosis. We commend to the medical societies of other counties the concentration plan of

public health work as adopted by the Marengo physicians.

THE SUBLIME ASSURANCE OF THE FRIEDMANN VACCINE PROPAGANDA.

A certain lawyer in Milwaukee, by the name of Rose, has written a letter to the Senior Editor of this JOURNAL asking him to "calmly and dispassionately consider such evidence as I may send to you respecting the merits of the Friedmann vaccine."

Mr. Rose will be remembered by Alabama physicians as the apostle from the city made famous by certain brews of beer who a few years ago came into our state to instruct from the public platform our people regarding the health-giving properties of alcoholic beverages. He is probably prompted by the same philanthropic impulses when he attempts to inform physicians and the public of the "miraculous results" of the serum that made Friedmann famous as well as rich.

The editor begs leave to assure Mr. Rose that he has already devoted considerable attention to the claims of the Friedmann vaccine, "in an unprejudiced way," and that his information was derived from "unprejudiced" sources, such as "unprejudiced" case histories wherein a few instances of temporary improvements were swamped by the authoritative reports of ultimate failure; he has considered the conservative estimates presented by investigators in hospitals and in the United States public health service, and has reached the conclusion that thus far the Friedmann "cure" has signally failed to make good; that, in this country at least, it is being exploited in a way that, in itself, would shake any faith an ethical physician might feel inclined to repose in it; and that not until medical authorities in the places where the experiment has been thoroughly tried have pronounced it trustworthy will he see any good reason for changing his opinion. One thing is certain; he will not accept as reliable, testimony in its favor from any physicians who are making it a specialty, or serve in hospitals chiefly devoted to its exploitation. He will not attach any value to the opinions of lawyers, however eminent, or of preachers, however devoted, for the simple reason that they lack the professional knowledge which alone could render them competent judges. As for testimonials, their absolute worthlessness is illustrated by the literature distributed by Royal Germateur, Peruna, and "Duffy's Pure" vile compound. "David S. Rose, lawyer," writes as follows:

"*We* opened *our* laboratories here on August 21, and so far *we* have treated *about* 100 cases." (Italics ours.—JOURNAL.)

One might wonder whether the "we" includes any physicians, or whether they are all lawyers.

Inspired by this liberal offer on the part of a representative of the legal profession to enlighten the doctors of the South on a medical point of great importance, will not some enterprising Southern doctor provide a *quid pro quo* by instructing Mr. Rose in the routine of court procedure in Wisconsin? It will not be necessary for the doctor to know any more about law than most lawyers know about medicine. Here is an opportunity for missionary work.

THERAPEUTICS

RUBEFACIENTS AND VESICANTS.

Certain substances when in contact with the skin cause a sense of heat or stinging accompanied with a visible hyperemia. This pnenemenon we call irritation. If it be continued, or if the irritation be severe, serum is effused between the epidermis and the derma, either in small vesicles or large blebs. This is termed vesication, or blistering.

Sometimes the drug or agent used seems to concentrate its energies upon or around the orifices of the sudoriferous glands, resulting in

the formation of small elevations filled with serum or pus. This is known as pustulation. All of these degrees of irritation of the skin are sometimes induced for specific purposes, and their prescription and management call for as much care and discrimination as any other line of therapeutics; otherwise serious results may follow. Because this is true, counter-irritants and vesicants have gone out of fashion. Not only is it true that the latter are seldom ordered, but the act of blistering a patient is, by many, considered barbarous and inexcusable. If proper knowledge and care are not to be exercised in their management, blisters are indeed inexcusable. On the other hand those practitioners whose experience has shown them the sudden relief from apparently desperate circumstances following upon the drawing of a large blister, or who have felt the pain of pleurisy subside as soon as the serum began to ooze under the epidermis, such physicians need no physiological explanation of the fact to insure their belief.

The argument that there is no more sense in blistering the chest for pleurisy than in putting carbolic acid on the staves of a barrel to stop the rot in potatoes inside is unsound. Such a statement betrays unpardonable ignorance of anatomy. The same node that supplies nervation to the exquisitely painful pleura supplies also the skin immediately over it. No wonder, therefore, that a powerful impression upon the terminal fibers of that nerve should reflect an influence to the diseased area opposite. Many drugs generally used as irritants will, if contact is prolonged, act as vesicants, or even pustulants.

The agents most commonly used as counter-irritants are, named in the order of their availability, as follows: Sinapisms or mustard plasters, iodine, capsicum, turpentine, chloroform, camphor, and ammonia.

Most of these have already been considered in these papers.

SINAPIS.

Sinapis, or mustard, is a typical counter-irritant, and the one generally used whenever such an agent is indicated. It is made from the seeds of both the white and black mustard plants. These are ground into a flour which is preserved in sealed cans, as there is a volatile oil which is a valuable part of the drug. To make a sinapism, or mustard plaster, this is wetted with tepid water (not hot water), and spread upon a thin piece of muslin or cheese cloth large enough to enfold it. The paste is spread on one end of the cloth, the other end is thrown over the paste and the wrong side, as it is called, is laid upon the patient's skin. The active elements of the mustard pass through the cloth and do their work, without leaving behind patches of the paste of dried mustard flour seen when the paste is applied directly to the skin.

When the skin is very tender, the dry mustard flour should be diluted with once or twice its volume of wheat flour before mixing. Or it can be first combined with the white of an egg, and then with a little water. Hot water spoils it, and should not be used. When a more gentle and prolonged contact is required a poultice should first be made of corn meal or ground flax seed, and a small amount of mustard flour added. Great care should be observed not to allow the sinapism to remain on the skin until a blister results.

Vesication by mustard is deep and severe, and very slow to heal. This agent should never be used on a child under ten years of age, because of the extreme delicacy of the tissues before adolescence.

The indications for counter-irritation are, pain without inflammation, such as neuralgias, sick headache, gastralgia, dysmenorrhea, etc. When there is internal congestion it has been found useful as a revulsive, aiding drugs such as atropin to draw the blood from the internal vessels to the external capillaries. In amenorrhoea it is used in a hot foot bath at bedtime every night when the period is due. In conditions of weakness from any cause, when the extremities are cool, warm baths containing a little mustard are very useful. Care should be observed in selecting a reliable specimen. This is recognized by its pungency when smelled, immediately upon opening the container. Or a little may be held upon the tongue for a few moments, when, if reliable, it will cause a feeling of heat and burning.

VESICANTS.

Vesicants, or epispastics, are agents that excite sufficient irritation in the skin, where they are held in close contact with it, to cause serum to be exuded between the true skin, or derma, and the epidermis. Properly managed the irritation goes no further or deeper than this; the serum is allowed to escape at one edge of the blister through a small opening made by an aseptic instrument, the loosened epidermis subsides and makes a germ proof dressing for the derma, and in twenty-four hours a new epidermis has formed and the blister is healed.

On the other hand, when the blistering agent

is allowed to remain in contact with the skin until the exudation of serum has begun to loosen the epidermis, a longer period will be required for the healing, while if the agent remains until the blister is fully drawn, and the serum be allowed to remain for hours in contact with the defenseless derma, its vitality may even be destroyed and a sloughing ulcer result.

These remarks apply particularly to the use of cantharidal plaster as a vesicant, the Spanish fly being the active agent.

The length of time blisters should remain in contact with the skin to be blistered depends upon the texture of the skin itself. The tender tissues of a delicate lady, or a child, will respond to the stimulation much more readily than those of a strong man. In such cases the place where it is secured, by its thin pad of absorbent cotton and bandage, must be frequently inspected, and as soon as any indication whatsoever—a slight blush of the surface, a shiny appearance, or small pimples, appearing—should be the signal for its instant removal, and the place should be dressed with a poultice made of clear starch, freely anointed with petrolatum and applied at body temperature. Under this poultice the blister will rise in an hour. Should it fail to do so the plaster can be reapplied, and observed at intervals of twenty or thirty minutes until some indication of action appears. Then reapply the warm starch poultice. As the blister rises the benefit should be at once apparent, whether in the relief of pain or of dyspnoea. The stimulation and the tendency to healing that are promptly induced in the affected surface often seem to be transmitted directly to the corresponding area within with happy results.

The serum from a cantharidal blister should never be allowed to dry on the skin, for it is saturated with cantharidin and will cause additional blisters. It should be caught on a moist, warm cloth. Sometimes, when a large blister is deeply drawn so much cantharidin is absorbed that strangury results. This is generally relieved by hot fomentations to the pubis. If severe, small doses of chloral are effectual. Warm, flaxseed tea, freely drunk, has a very soothing effect.

BOOK REVIEWS

Surgical Diagnosis and Urinalysis.

By James R. Arneill, A.B., M.D., Professor of Medicine and Clinical Medicine in the University of Colorado New (2d) edition, revised and enlarged. 12mo., 170 pp., with 83 engravings and a colored plate. Cloth, $1 net. The Medical Epitome Series. Lea & Febiger, publishers, Philadelphia and New York. 1914.

Undoubtedly Dr. Arneill's little book is one of the best manuals of laboratory methods of recent publication. So brief, so simple, and yet so complete, that it is a distinct achievement to bring within the compass of an epitome such an extensive subject as Clinical Diagnosis. It contains all the recent as well as the established methods of examination of the secretions, excretions, and other body fluids, in each instance, contrasting the pathological state with the normal. With a moderate laboratory equipment, most of these important tests can be done without any special previous training.

Your Child Today and Tomorrow.

By Sidonie Matzner Gruenberg. Published by J. B. Lippincott & Co. $1.25.

This attractive book of 234 pages discusses in a very sensible way the problems of parenthood. It is a most instructive treatise on the training of children and should be carefully read by physicians. It is the kind of book that physicians can safely advise parents to read.

Leviathan. The Record of a Struggle and a Triumph.

By Jeannette Marks. 318 pages. Hodder & Stoughton. George H. Doran Co., Publishers, New York.

The story is simply that of the struggles of a young scientist to overcome the ever-increasing hold of the opium habit. He is assisted in this fight by a devoted, self-sacrificing wife and a faithful, aged servant. After innumerable unsuccessful attempts at a cure, by a heroic act of devotion on the part of his wife, in rescuing him from physical danger while under the influence of the drug, he awakens to the fact of her great love, and by making her his prime consideration, he is able to conquer himself.

One is impressed by the deep insight and accurate knowledge of the author in regard to the effects and influences of opium. The book is also a plea for the proper measures and methods of meeting this national problem, and will undoubtedly be an important factor in educating the people. It is recommended to the profession and the laity as a book worth while, which weaves fundamental scientific facts in a beautiful and interesting story.

A Text-Book of Physiology.

Fifth edition thoroughly revised. A text-book of physiology for medical students and physicians. By William H. Howell, Ph.D., M.D., Professor of Physiology, Johns Hopkins University, Baltimore. Fifth edition thoroughly revised.

Octavo of 1,020 pages, fully illustrated. Philadelphia and London: W. B. Saunders Co., 1913. Cloth $4.00 net, half morocco $5.50 net.

Howell's Physiology is recommended in every medical school and in a majority it receives first place. Rightly so, for of the various and numberless works there is none that approaches the subject in a more liberal manner. The frequent editions bespeak for the popularity of the book, and the desire of presenting the present-day physiology. The essential changes have been made in the chapters on metabolism and digestion, in as much as this subject has received the greatest attention in recent months. All together, it is one of the most easily read books written on physiology. This makes it easy for the physician to review the subject of organic functions without having to worry through a lot of dull statistics and detailed experiments.

Dorland's American Illustrated Medical Dictionary.

A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Science, Nursing, Biology and kindred branches; with new and elaborate tables. Seventh revised edition. Edited by W. A. Newman Dorland, M.D. Large octavo of 1,107 pages, with 331 illustrations, 119 in colors. Containing over 5,000 more terms than the previous edition. 1913. Flexible leather $4.50 net, thumb indexed $5.00 net. W. B. Saunders Co., 1913. Philadelphia and London.

As medical science changes it is necessary to revise the dictionaries. Dorland's Dictionary, which has been universally acknowledged as one of the most complete and accurate now available for the graduate as well as undergraduate, represents in this new seventh revised edition information thoroughly abreast with the times. After using it for a short time one would not care to admit he had ever been without Dorland's Dictionary. Such a book is absolutely essential to the modern student.

Dorland's American Pocket Medical Dictionary.

Eighth edition revised and enlarged. 32mo. of 677 pages. Philadelphia and London: W. B. Saunders Co., 1913. Flexible leather, gold edges, $1.00 net; thumb index, $1.25 net.

This pocket edition is everything that former editions have been and more. Facts of modern investigation and words of recent coinage are easily found among the revisions. A very convenient size for quick reference.

Anatomy and Physiology for Nurses.

Third Edition, Thoroughly Revised.

By LeRoy Lewis, M.D., Formerly Surgeon to and Lecturer on Anatomy and Physiology for Nurses at the Lewis Hospital, Bay City, Mich. Third Edition Revised Thoroughly. 12mo. of 326 pages, with 161 illustrations. Philadelphia and London: W. B. Saunders Company, 1913. Cloth, $1.75 net.

This editon, like the two preceding, contains the essentials of anatomy and physiology written in a plain and concise style. A feature of particular value to student nurses is the list of review questions at the end of each chapter. An excellent book for the nurses.

Dietetics for Nurses.

By Julius Friedenwald, M.D., Professor of Gastroenterology in the College of Physicians and Surgeons, Baltimore, and John Ruhrah, M.D., Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore. Third edition enlarged and revised. 12mo. volume of 431 pages. Philadelphia and London: W. B. Saunders Co., 1913. Cloth $1.50 net.

In this work on dietetics for nurses there are the usual subjects of chemistry and physiology, of food digestion, proper feeding in infants, the aged, and in the different diseases. The subject is presented in a scientific though not technical manner, and deals with the essentials of dietetics rather than an enumeration of a lot of recipes. A thoroughly practical and useful book.

The Education of the Will.

By Jules Payot, Litt.D., Ph.D. Authorized translation by Smith Ely Jelliffe, M.D. Third American edition from the thirtieth French edition. 424 pages. Price $1.50. Funk & Wagnalls Co., New York.

The theory and practice of self-culture represent the basic theme of this intensely interesting and helpful book. Character, as the resultant of various external and internal forces operating in and upon the individual, and the ultimate education and subordination of the will, are essential elements in a cultured, happy and useful life. The author emphasized the relation of character, education, bodily hygiene, etc., in the proper education of the will. Though a psychological treatise, it embraces moral, medical and educational ideals.

SOUTHERN MEDICAL NEWS

ALABAMA.

On December 30th Dr. Z. E. Tyler, 74 years of age, died at his home at Bamford after a lingering illness. He leaves a widow and eight children.

The records of the health department at Birmingham for 1913 show 352 violent deaths, including homicides, suicides and accidents. There were 133 homicides, 20 suicides and 199 accidental deaths.

In January a public health campaign was inaugurated in Russell county beginning at Hatchechubbee. Dr. J. F. Orr was in charge.

At Montgomery for the second time in the his-

(Continued on Advertising Page 18.)

STAFFORD WATER

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MEDICAL NEWS

(Continued from Page 254.)

tory of the State Board of Medical Examiners a negro woman has applied for a license to practice medicine in Alabama. Her name is Daisy Northcross and she is a resident of Montgomery. She was educated at the Bennett Medical College at Chicago.

At Mobile on January 13 Dr. N. P. Colwell, of the A. M. A. Committee on Medical Education, inspected the School of Medicine of the University of Alabama, spending the entire day in the various departments. He was making an inspection tour of all the Southern medical colleges.

At Mobile, January 23, the City Health Officer ordered the Marechal public school closed on account of a case of meningitis, which developed in one of the pupils, a son of the janitor. The other pupils at once received preventive inoculation. The school was reopened January 26, there being no indication of any spread of the disease.

At Mobile a negro named C. E. Jones was arrested on the charge of practicing medicine without a license. A negro woman swore that he came into her house uninvited and introduced himself as "Dr. C. F. Jones, D. S. G. V.," and wrote a prescription for which he charged her six dollars.

Dr. Courtney W. Shropshire of Birmingham, is visiting New York and other medical centers.

On January 2 at Selma Dr. Charles W. Stiles, of the U. S. Public Health Service, delivered a lecture on sanitation in which he advocated the segregation of the negro and white races.

At Birmingham a free dispensary will be erected this year at a cost of $50,000.

At Greensboro, January 2, Dr. Edgar P. McCollom, aged 43 years, died. He had been in bad health for about two years.

The officers of the Clarke County Medical Society for 1914 are as follows: President, Isham Kimball; Vice-President, J. T. Kelley; Secretary, Jesse Cobb; Treasurer, L. O. Hicks; Health Officer, J. A. Kimbrough; Librarian, J. W. Armistead.

ARKANSAS.

At Hot Springs, January 6, several physicians were cited to appear before the Federal Registration Board to answer certain charges. The results have not been reported to this office.

At Argenta, January 11, Dr. P. M. Fly, of the hookworm commission, examined more than 25 cases of various ages, but failed to find the disease present in any.

At Stuttgart, January 14, the City Council appointed Dr. W. H. Moon special health officer with instructions to see that all orders of the State Board of Health are carried out.

At Little Rock, January 15, Dr. M. T. Clay, 57 years old, for the last fifteen years a practicing physician in Little Rock, died shortly after six o'clock p.m., while sitting in his buggy at the corner of Twelfth and Battery streets. The cause was supposed to be heart disease. He is survived by his widow, a son, and a daughter.

At Stamps, January 12, Agent Wilson, of the Cotton Belt Railroad, was found to be suffering with smallpox. He had been mingling freely with the citizens, and general vaccination was ordered.

Smallpox is also reported prevalent in Cleburne county, 22 cases having been reported. The county has no health officer, and Dr. Morgan Smith, State Health Officer, went to Higden, the county seat, to make an investigation.

At Little Rock the City Board of Health has notified the public that any merchants or hucksters or other dealers in provisions who failed to comply with the order issued by the State Board of Health requiring a covering over all foods offered for sale, will be prosecuted to the extent of the law.

FLORIDA.

Dr. Henry P. Bevis and his bride, nee Miss Florence Henschew, have made their home in Arcadia. They were married in Oakland, Fla., in December.

Dr. John S. McEwan has been appointed examining surgeon for the Orlando Board of Pension Examiners. He succeeds the late Dr. J. D. Rush.

Pensacola has been expecting that the regular winter maneuvers of the United States Marine Corps would be conducted at that port this year instead of at Guantanamo, on account of smallpox there. It appears that the report was a mistake.

The Monroe County Medical Socity announces that they are actively interested in the prosecution of Dr. Arthur Grenoble for practicing medicine in Key West without having first complied with the provisions of state laws. He claims to be a cancer specialist, and not to use the knife. The Jacksonville Times-Union says that he has already "served a jail sentence some time ago on the same charge". Nevertheless, "he now has a flourishing practice."

The Duval County Medical Society, headquarters at Jacksonville, has presented V. C. Johnson

(Continued on Advertising Page 20.)

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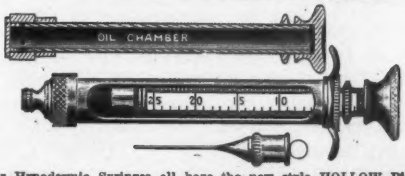

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MEDICAL NEWS

(Continued from Advertising Page 18.)

of the Dinsmore Dairies with a silver loving cup, for having the cleanest milk throughout the year 1913.

At the annual banquet of the Hillsboro County Medical Society it is claimed that all the scars and old wounds from past disagreements were healed forever by the laughing salves and verbal bandages applied secundum artem under the Red Cross by that eminent psychological healer, Dr. Truleson, as toastmaster, and Dr. J. C. Knight as president.

At the last meeting of the Leon County Medical Society, held at Tallahassee, the following officers were elected: Dr. H. E. Palmer, Tallahassee, President; Dr. J. C. Davis, Quincy, Vice-President; Dr. F. Clifton Moor, Tallahassee, Secretary and Treasurer. As the membership of the society is about equally divided between Leon and Gadsden counties it was decided to have the meetings alternate between Tallahassee and Quincy. The next meeting will be held at Quincy.

GEORGIA.

At Atlanta, January 7, Dr. W. J. Hodges, aged 65, died at his residence, 289 North Jackson St. He leaves a widow and one son.

Dr. H. I. Reynolds, who graduated in 1912 at Johns Hopkins and has since that time been a physician in a hospital there, has decided to practice his profession in Athens.

Dr. T. G. Swanson, aged 37, died January 1 after an illness of ten days. He resided at Fairburne, and was unmarried.

At Atlanta the City Board of Health re-elected Dr. W. E. Quillian president and Dr. J. H. Bradfield, vice-president.

Dr. T. F. Abercrombie, who recently moved from Waycross, has been made Health Officer at Brunswick.

The Crawford W. Long Memorial Hospital is one of the latest additions to Atlanta's medical institutions. It is located at 497 Cherokee avenue. The executive committee is composed of Drs. Hansell Crenshaw, Francis G. Jones, and W. M. Dunn.

Savannah is rejoicing over Secretary McAdoo's recommendation to Congress that $47,000 be appropriated for the establishment of a pellagra hospital at that place. The whole state hopes it will be accomplished.

At Macon on December 30 the friends of Dr. J. J. Shubers had the pleasure of congratulating him on his 75th birthday.

In Decatur county the board of county commissioners have voted the money for the purchase of the necessary medicines for an active campaign in the county against the hookworm. The Rockefeller money will pay for the services of the physicians and their expenses.

At the annual meeting of the Georgia Medical Society, held at Savannah in the gentlemen's parlor of the Desoto Hotel a large number of the city's physicians and surgeons were present. The society expects to occupy its new home at 612 Drayton street very soon. Dr. J. L. Jackson was elected president; Dr. E. R. Corson, vice-president, and Dr. V. H. Bassett, secretary-treasurer.

The Georgia Surgeons' Club has arranged a Travel Study Tour for Southern Surgeons to the Clinical Congress of Surgeons of North America, to be held in London, July 27 to August 3, 1914. The duration of the tour will be sixty days. The amount considered necessary to cover all ordinary expenses, including first class arrangements in every respect, is $570. Further information can be secured from the secretary of the club, Dr. R. M. Harbin, Rome, Ga.

KENTUCKY.

At Paducah, Dr. J. Q. Taylor has assumed charge of the local Illinois Central Hospital, succeeding Dr. D. G. Murrell, resigned, who has been the head of the hospital for over thirty years.

Dr. Walter Lackey, a prominent Hopkinsville physician, has moved to Paducah.

Dr. L. C. Redmon, of Lexington, announces the removal of his office to the new Fayette National Bank Building.

At Louisville, in January, Dr. J. W. Fowler, superintendent at the city hospital, issued an order requiring all internes and nurses vaccinated, as a result of the discovery of a case of smallpox in the hospital.

At Paducah, the annual report of the Jackson Hill Tuberculosis Sanatorium shows an investment of $4,734.16. The association asks the city to contribute $50 per month to the support of the institution.

At Louisville Dr. Ed. Meyer, of 1022 West Market street, awoke one morning to find his bed burning about him. He thought he had put his cigarette away. He was taken to Saints Mary and Elizabeth Hospital. His condition is regarded as serious.

Dr. F. Kalb and Dr. C. Moore, of the United

(Continued on Advertising Page 22.)

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This Anæsthetic, manufactured by a perfected process, complies with all the requirements of the U. S. P., and being limited to a

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insures proper content of Alcohol, conducive to uniform Etherization.

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MEDICAL NEWS

(Continued from Advertising Page 20.)

States Public Health Service, experts on trachoma, are assisting Dr. J. H. Oakley in the crusade being waged in Jefferson county against that infectious disease. It is claimed that trachoma is the cause of the blindness of more than half of all the inmates of the Kentucky Institution for the Blind.

The trustees of the University of Louisville have created a Hospital Committee composed of physicians and surgeons, which will select the medical staff of the hospital, subject to the approval of the trustees and the Board of Public Safety. Dr. Ap. Morgan Vance, Dr. William A. Jenkins, Dr. H. H. Grant and Dr. Ben Carlos Frazier constitute the committee and Dr. David C. Morton, assistant dean of the Medical Department of the University, is ex-officio a member.

At Lancaster Dr. William Burnett has bought for $140 an acre the 160-acre farm of W. B. and J. H. Dale, north of the city.

At Paducah, after fighting the East Tennessee Telephone and Telegraph Company with a boycott for two years, the McCracken County Medical Society has relented and again had telephones placed in their offices and residences.

LOUISIANA.

At Shreveport, Dr. C. H. Carson, chief chemist of the Louisiana Industrial Institute, at Ruston, was thrown from his buggy. His hip was severely injured.

The mayor of Hammond claims to be ex-officio the health officer of the town. Dr. Dowling, president of the State Board of Health, says the city is without a board of health and without a health officer, and that none but a graduated physician elected by the city council can fill the office legally. Meanwhile, smallpox has made its appearance.

The New Orleans Medical Society has presented to Dr. C. C. Bass an elegant medal five inches in diameter of pure gold in recognition of his work in the study of malaria. Nine small circles around the medal on one side show as many stages in the culture of the malarial germ and the reverse carries pictures in relief of the instruments used in the culture.

At Pineville, in the Louisiana Hospital for the Insane, there are 686 patients. The board of administrators report that the institution is in fine condition.

At New Orleans a woman physician, Dr. Lydia Moisselle, was indicted by the Federal grand jury for the western district of Louiisana on a charge of unlawfully using the mails.

The Board of Councillors of the Louisiana State Medical Society have endorsed Dr. E. L. Leckert for the position of Secretary-Treasurer of the Louisiana State Board of Medical Examiners. His name has been sent to Governor Hall for confirmation. He succeeds Dr. A. B. Brown, deceased, whose untiring zeal and constant devotion as secretary to the board contributed notably to the elevation of medical standards in Louisiana.

At South Mansfield an outbreak of smallpox among the employes of the Frost-Johnson Lumber Company has caused them to appeal to the State Board of Health for assistance. Dr. Dowling sent Dr. Meyer Newhauser to take charge.

At New Orleans some outraged baker managed to slip a folded iron nail into a mince pie destined for Dr. Dowling's eating. His molars refused the job and the State Health Officer preserved the "infernal machine" as a visible evidence of the necessity for food inspection.

MARYLAND.

At Johns Hopkins only 90 applicants will be received into the freshman class of the medical school. All applicants will receive a careful examination and those best prepared will be admitted.

On January 8 a dance was held in the corridors of the Johns Hopkins Hospital at which 250 persons, including many leading physicians from Baltimore, participated. Dr. Winford B. Smith, superintendent of the hospital, aided by Mrs. Smith and the doctors of the staff, were the hosts of the occasion. A buffet supper was served after the dance.

Dr. S. T. Nicholson, physician to Syndenham Hospital, sent the Department of Health his resignation, to take effect in March. Upon receiving notice of the fact Mayor Preston sent word to Dr. Nicholson over the 'phone that his resignation would take effect immediately and he was to leave at once. It seems that his offense was that in addressing the Baltimore Medical Society he had characterized the hospital as "entirely inadequate."

At the Mercy Hospital in Baltimore some changes have been made in the staff. Dr. R. E. Wynne, formerly of Jackson, Miss., is appointed to the position of accident physician. Dr. Bernard

(Continued on Advertising Page 24.)

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In every complement-fixation test for syphilis made in our laboratory, we employ both the original Wassermann sheep-hemolytic system and the Noguchi human-hemolytic system. In this way we are able more accurately to control our results so that our reports have a greatly increased value over those for which the single system is used. Our fee for this test is $10.00.

COMPLEMENT-FIXATION TEST FOR GONORRHEA	$10.00
ABDERHALDEN'S SERO-DIAGNOSIS OF PREGNANCY	10.00
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AUTOGENOUS VACCINES HAVE BEEN REDUCED TO	5.00

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MEDICAL NEWS

(Continued from Advertising Page 22.)

V. Kelly takes a position in the service of Dr. Cary B. Gamble.

Dr. Grace De Witt, who has for several years been junior assistant physician in Washington at the Government Hospital for the Insane, has left that service to go to Philadelphia.

MISSISSIPPI.

Dr. B. S. Hood, assistant State Sanitary Inspector, after visiting Biloxi, reported that conditions at many of the fruit stands were very bad. In one case he found celery lying on an unclean floor. He says the trouble is principally with the small shopkeepers.

Dr. A. G. Payne, of Abdingdon, Va., has associated himself with Dr. Malcolm Campbell, recent house surgeon at the New York Polyclinic, of Greenville, for the practice of medicine.

At Meridian the Lauderdale County Medical Society elected officers for the ensuing year as follows: President, T. D. Bourdeau; Vice-President, K. T. Klein; Secretary-Treasurer, G. F. Douglas, all residing at Meridian.

At Jackson, Dr. J. C. Cathings, superintendent of the prison farms, has entered a flat denial before the penitentiary investigating committee to the charges of brutality to convicts, made by the Rev. J. D. Ellis, former chaplain of the state prison. He said that as a matter of course it was often necessary to whip the convicts, but the punishment was neither cruel nor brutal. The instrument was a broad leather strap.

Arguments before the legislature in behalf of anti-child labor legislation were fortified by the exhibition of moving pictures depicting conditions surrounding child labor in the mills and mill towns of the state.

The results of the election of officers at the last meeting of the Lauderdale County Medical Society for 1914 was as follows: President, Dr. T. D. Bourdeaux, Meridian; Vice-President, Dr. K. T. Klein, Meridian; Secretary and Treasurer, Dr. G. F. Douglas, Meridian.

The legislature has appropriated $4,300 to the Natchez Hospital to cover a deficit in the management of its affairs. The bill was passed by the senate but refused by the house. When it came from the senate the second time it was passed.

The Hinds-Rankins Counties Medical Society, of which nearly all the physicians in Jackson are members, are said by the newspapers to have issued an edict that druggists must quit prescribing over the counters.

NORTH CAROLINA.

Dr. James A. Sexton, formerly a well-known physician of Raleigh, died at his home at Harnett, Harnett county, January 7, at a ripe old age.

At Watertown, Dr. E. E. Harrington, chairman of the committee on the care of the teeth of the children of the grammar schools of the city, has examined the teeth of over 5,000 children. He was assisted by Drs. Denny, Gold and Danforth. This was their second visit and they found conditions much improved.

In order to encourage compliance with the new law on vital statistics, Gov. Craig has announced that he will write a letter to every mother, the birth of whose baby is properly recorded according to law. The State Board of Health will also send literature containing the latest instructions for infant feeding.

At Charlotte several physicians, namely Drs. Walker, Wakefield, Myers, Pharr, and McLaughlin, have moved into the newly remodeled offices in the Hutchison building, 200 North Tyron street.

Dr. J. R. Gordon, representative from Guilford, has accepted a position with the Department of Vital Statistics of the State Board of Health as a special field agent to assist in securing the registration of every birth and death occurring in North Carolina in 1914.

Dr. Howard A. Kelly, of Baltimore, while visiting Asheville, delivered an informal address to the medical society on the use of radium in the treatment of cancer.

OKLAHOMA.

At Lawton, Dr. T. W. Brewer, who was accused of having performed a criminal operation upon the person of Mrs. Myrtle Newton, of Marlow, was found not guilty by the jury.

The Oklahoma County Medical Society held their annual banquet in the Skirvin hotel. One hundred and fifty persons partook of the feast. The new officers were installed, namely: President, M. Smith; Vice-President, J. W. Riley; Secretary, J. B. Sorgatz.

Dr. H. L. Jamieson, of Logan county, has applied to the district court of Oklahoma county for an order restraining the State Board of Medical Examiners from revoking his license to practice medicine in Oklahoma until final adjudication

(Continued on Advertising Page 26.)

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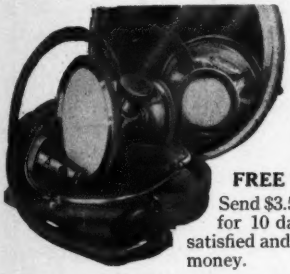
is the only instrument that will give you an accurate and simple means of contrasting one sound with another. Its Acoustic Rheotome exaggerates, reduces, graduates all sounds that pass through it. Regulates them with absolute accuracy. Of unquestionable value in all diagnostic examinations for the different pathological changes of the muscular system of the heart, lungs and blood vessels.



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Our Baird's Air Cushion positively will correct all uterine displacements, procidentia, prolapsus, retroversion, etc. The price, to physicians is $5 complete or $3 without the shoulder attachments. Send check with order and we will refund the money if you are dissatisfied after faithfully using the outfit for ten days.

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And the suit must please you in every particular or you don't pay us one cent. Send for FREE Style Book and Samples. Write for it today. Shows latest styles and large samples of Black and Blue Woolens. It's Free.

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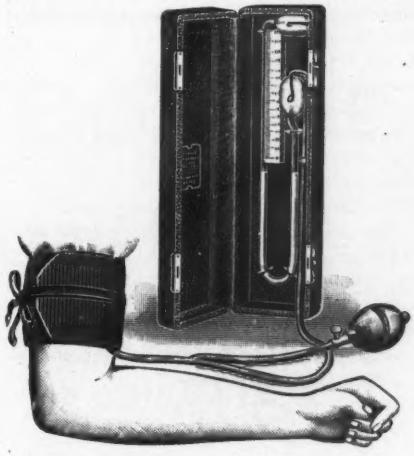

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MEDICAL NEWS

(Continued from Advertising Page 24.)

in court. The grounds for their action are that he obtained his license by fraud.

SOUTH CAROLINA.

The Greenville County Medical Association, according to the Greenville Daily News, has decided upon a "black list." Each doctor will from time to time submit the names of his wilfully delinquent patients, together with the amount due him, and these names will be listed in a common book for the reference of all the doctors. The charity patients and the indigent sick will be cared for.

Edgar A. Hines, M.D., of Seneca, Secretary-Treasurer of the South Carolina Medical Association, is occasionally delivering popular lectures on school hygiene, under the auspices of the American Medical Association.

The Atlanta, Ga., Constitution announces that the state senate of South Carolina "has joined the procession of legislative bodies that decline to impose a sterilized Cupid upon humanity." It rejected by a decisive vote an eugenical marriage law.

Dr. Paul T. Switzer, formerly of Ft. Mott, has moved to Union.

A bill was introduced into the South Carolina house of representatives providing for the gathering of vital statistics throughout the state.

At Spartanburg Dr. H. R. Black suffered a serious injury to his right arm. His horse became frightened and swerved the buggy into the curbing, crushing the doctor's arm between the vehicle and a telegraph post. He was taken to Philadelphia for treatment.

The Orangeburg County Teachers' Association at a regular monthly meeting unanimously passed a resolution approving the medical bill before the legislature providing for medical examination of the pupils in public schools.

TENNESSEE.

At Memphis Dr. W. P. Berry, aged 73, was arrested on a charge of selling morphine and cocaine in quantities of more than one dose at a time. He is a registered druggist and wrote his own prescriptions. This is probably the first case under the new law. He gave bond for $1,000.

Dr. James Glasgow, of Brownsville, died at St. Joseph's Hospital, December 30. He had been visiting his son in Memphis and was injured by a fall during an attack of vertigo. His age was 88 years. He was a Confederate veteran, serving under Forrest.

Dr. W. G. Ewing, of Franklin Road, near Nashville, died January 14 at his home of heart failure. He was 66 years old and widely and favorably known, having served as dean of the Medicad Department of the University of Nashville and Vanderbilt University.

Dr. Melbourne Clements, a well known physician of Chattanooga, has been appointed acting assistant surgeon for the United States navy. He will be appointed examining surgeon for the entire southeastern district, the headquarters for which are at Chattanooga.

At Lebanon Dr. J. J. Richardson died, aged 66 years, of bronchial asthma. He was a member of Forrest's cavalry during the civil war.

Dr. J. M. Gassoway, surgeon-inspector in the Public Health Service of the United States, visited Memphis in January to inspect the Marine Hospital. He is next to the oldest man in point of service in the United States Public Health Service, having entered in 1870. His last previous visit to Memphis was in 1853.

Dr. J. C. Bell has been appointed superintendent of the City Board of Health of Memphis, succeeding Dr. Max Goltman, who was not a candidate.

A serious smallpox situation has developed at Abingdon as a result of which church services Sunday were prohibited and two revivals have been stopped by the authorities. As usual the disease had been mistaken for chicken pox.

At Sweetwater several valuable cattle have died with hydrophobia. A strange shepherd dog had appeared on the farm and remained among the cattle for several hours.

TEXAS.

At Galveston Dr. Walter Kleberg, City Health Officer, barely escaped suffocation by smoke from a burning chimney pouring into his room through crevices in the wall. He was awakened by the firemen.

At the Riley homestead, five miles north of Pilot Point, lives one who is supposed to be the oldest active practitioner in the world. More than 200 friends and relatives on the 12th of last December gathered at the home of Dr. John Schlegel Riley to celebrate his one hundredth birthday. He has great strength, perfect mental powers, excellent eyesight, good teeth and a clear memory. Only his hearing is impaired, and that but slightly.

(Continued on Advertising Page 28.)

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Sodium Sulphate	50.005
Magnesium Sulphate	30.971
Calcium Sulphate	2.817
Sodium Chloride	2.503
Magnesium Carbonate	.352
Iron Oxid and Alumina	.016
Silica	.005
Total Solids	86.669

The water was excellent from a sanitary standpoint.

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IS A MORE POWERFUL ANTISEPTIC
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Sample and Full Literature on Request.

MEDICAL NEWS

(Continued from Advertising Page 26.)

Dr. M. M. Carrick, of Dallas, is spending two months in New York and Boston. Before returning to Texas he will attend the meeting of the Council on Legislation of the American Medical Association, which meets in Chicago February 24.

At San Antonio Dr. S. Burg, former city physician, condemns the sanitary conditions of the city. He includes both the milk and meat supplies in his disapproval.

At Fort Worth the "Doctors' Luncheon Club" has changed its regular meeting place from the Terminal Hotel to the Seibold, in order to make it more convenient to the section where most of the physicians have offices.

At San Antonio seven physicians were indicted on charges of violating the postal laws. One pleaded guilty and was fined $500. The others demanded a trial and were acquitted.

At Dallas the Southern Methodist University Medical College, together with Baylor University Medical College, have established a pathological laboratory and an X-ray laboratory at Parkland Hospital. They also supply a competent pharmacist to fill prescriptions and prepare medicines.

At Austin Dr. Morris Boerner, director of the State Hookworm Commission has appointed Dr. C. H. Brownlee to conduct dispensaries, make examinations and give free treatments in Kaufman County.

At Galveston the State Hookworm Commission, headed by Dr. H. O. Judkins, is at the service of persons needing treatment. In the first fifteen examinations made no infection was found and indications are that there will be but little hookworm disease discovered.

At San Antonio a Dr. Lon H. Herrington was convicted of practicing medicine without a license, fined $150 and sentenced to one day in jail. His plea was that he did only "Chiro-practice and gave no medicine." He has appealed his case.

Dr. M. M. Carrick, of Dallas, after spending two months in New York and Boston, attended the meeting of the A. M. A. Council on Legislation at Chicago, February 24th.

VIRGINIA.

At Richmond President S. C. Mitchell, dean of the Medical College of Virginia, has been invited to become the head of the Education Board of the Baptist State Convention of South Carolina. He has declined the offer.

At Milford, January 5, Dr. William L. Broaddus died at his home aged sixty-eight years.

George P. Johnson, general manager of the Chesapeake & Ohio Railway Company, has appointed Dr. W. P. Oppenheimer as chief surgeon. He succeeds Dr. C. W. P. Brock, who after serving as chief surgeon for nearly thirty years, has retired on a pension.

At Lewisburg, December 27, Dr. Henry Spier Pole, for forty years practicing physician at Hot Springs, Va., died at the home of his daughter, Mrs. H. M. Austin. His age was sixty-eight years.

Dr. Levy, Chief Health Officer of Richmond, recommends all citizens who have not been vaccinated to do so at once, there being several smallpox patients in the hospital and rumors of many expcsures.

The Medical Corps of the First Virginia Infantry is composed of the teachers and students of the Medical College of Virginia to the number of twenty-four enlisted men and four officers.

The Board of Aldermen of Richmond have concurred in the action of the Common Council in accepting the loan of the Virginia Hospital from the Medical College of Virginia. The future management and control has been agreed upon.

Dr. George A. L. Kolmer, who is known from his association with the State Board of Health, has decided to locate in Salem.

WEST VIRGINIA.

At Charleston Dr. John H. McCollough, chief medical examiner of the public service commission, slipped away from public view for several weeks. When he returned he brought with him a lovely bride whom he had captured at Huntington. Before returning to Charleston he took a bridal trip to Chicago.

At the annual meeting in Cumberland of the Alleghany County Medical Society, Dr. John R. Littlefield presented a paper entitled "A Hypothetical Discussion of the Cancer Problem," in which he advanced the theory that bedbugs carry cancer.

At Grafton all of the employes of the Baltimore & Ohio Railroad between Clarksburg and New Martinsville were ordered to be vaccinated by the officials of the company on account of an outbreak of smallpox that prevailed in that district.

At Wheeling Dr. S. L. Jepson, Secretary of the State Board of Health, has announced that the epidemic of smallpox, which for a time assumed serious proportions in Wetzel county, is under control. Over 2,000 persons were vaccinated.

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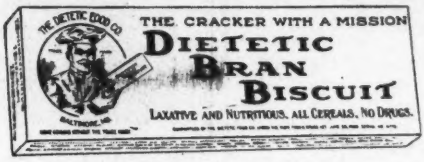

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Dietetic Bran Biscuit contain Pure Cereals only. No drugs. They induce their laxative effect by mechanically stimulating and increasing peristaltic contractions of the entire intestinal tract, thus causing, in the natural way, a regular and healthy evacuation of the bowel.

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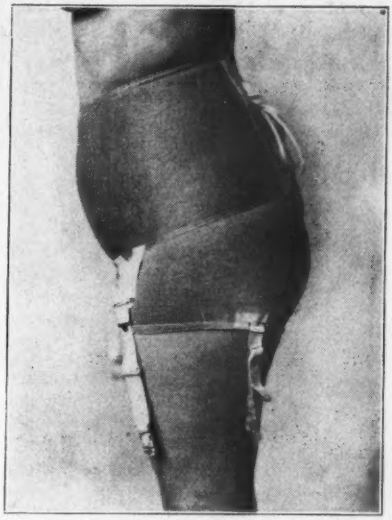

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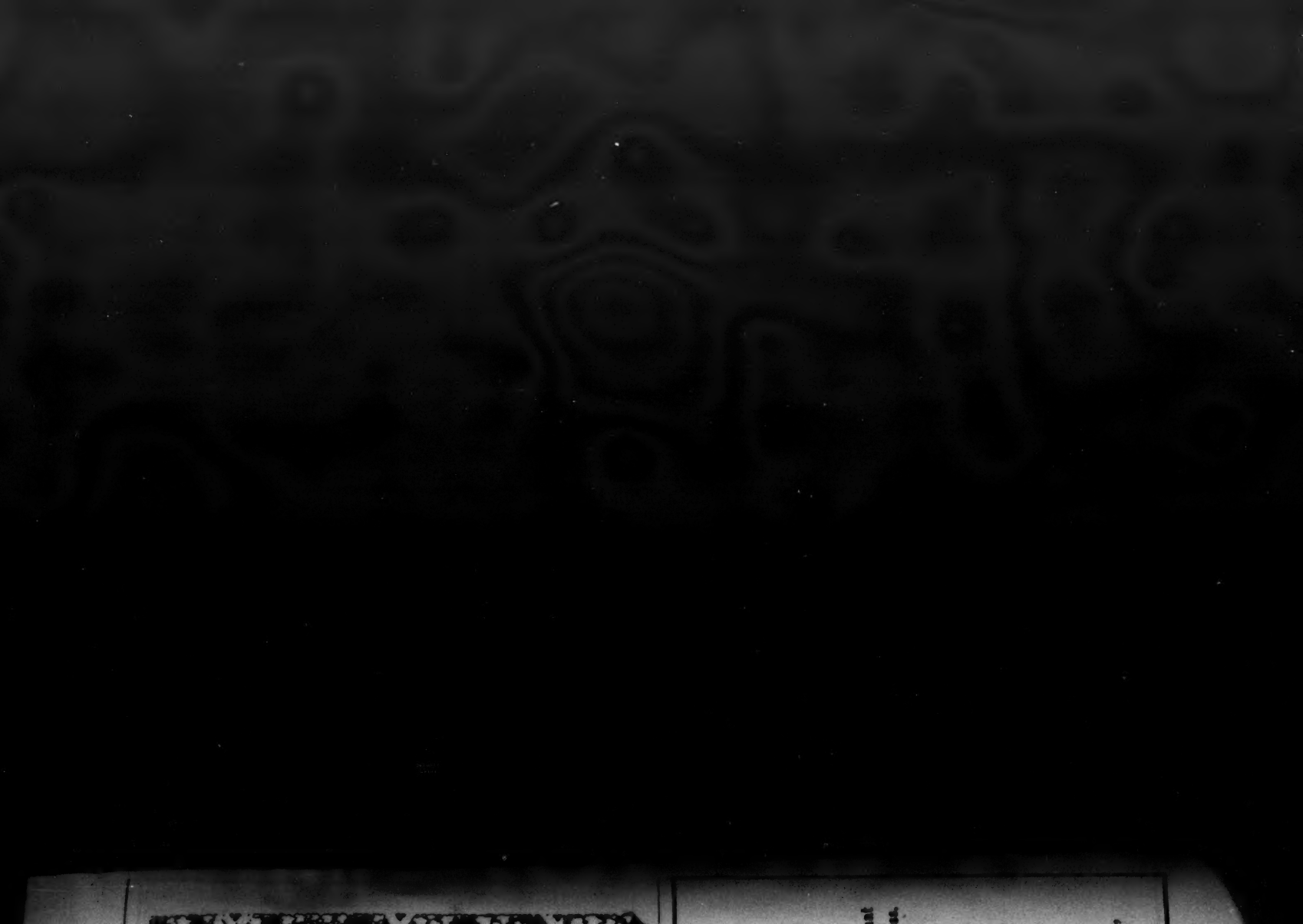

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